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●SANYO Electric Co.,Ltd. Semiconductor Company Homepage

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TV IC Lineup that Has Earned the Top Market Share

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New proposals from SANYO, the industry leader in TV IC sales worldwide.

SANYO has now developed the SUSOC(TM) series of on-chip microcontroller TV signal-processing ICs that support all TV signal standards worldwide.

SANYO was also one of the first companies to respond to digital TV system needs with devices based on SANYO's industry-leading bipolar technology. SANYO provides powerful support as the curtain rises on full-scale adoption of digital TV.

For worldwide TV, for next generation TV, SANYO ICs can help you open new markets worldwide.

Digital TV Decoder System Chip Set

SANYO 480i / 480p down decoder chipsets support both digital satellite broadcast and digital terrestrial broadcast reception, and are optimal for compact and popularly-priced TV sets.

Color TV I²C Bus System Chip Set

SANYO's extensive lineup of color TV I²C bus control system ICs support design and manufacture of products appropriate for any and all markets.

SUSOC™

Built-in CTV microcontroller TV signal-processing system ICs
 Full lineup that covers all worldwide markets
 Global pin-compatible series (Multiformat, PAL/NTSC, NTSC)

LC863 Series

The LC863 Series devices are multifunction high-speed 8-bit CMOS system microcontrollers that include OSD functionality. This series provides simple and easy support for frequent specification changes during production ramp up and specification changes by target application by providing flash ROM versions instead of the earlier erasable EPROM and one-time programmable PROM versions. In addition to the well-received large-capacity display RAM, the LC864 Series provides a high-performance OSD function that features increased CGROM capacity and provides a simple graphics function.

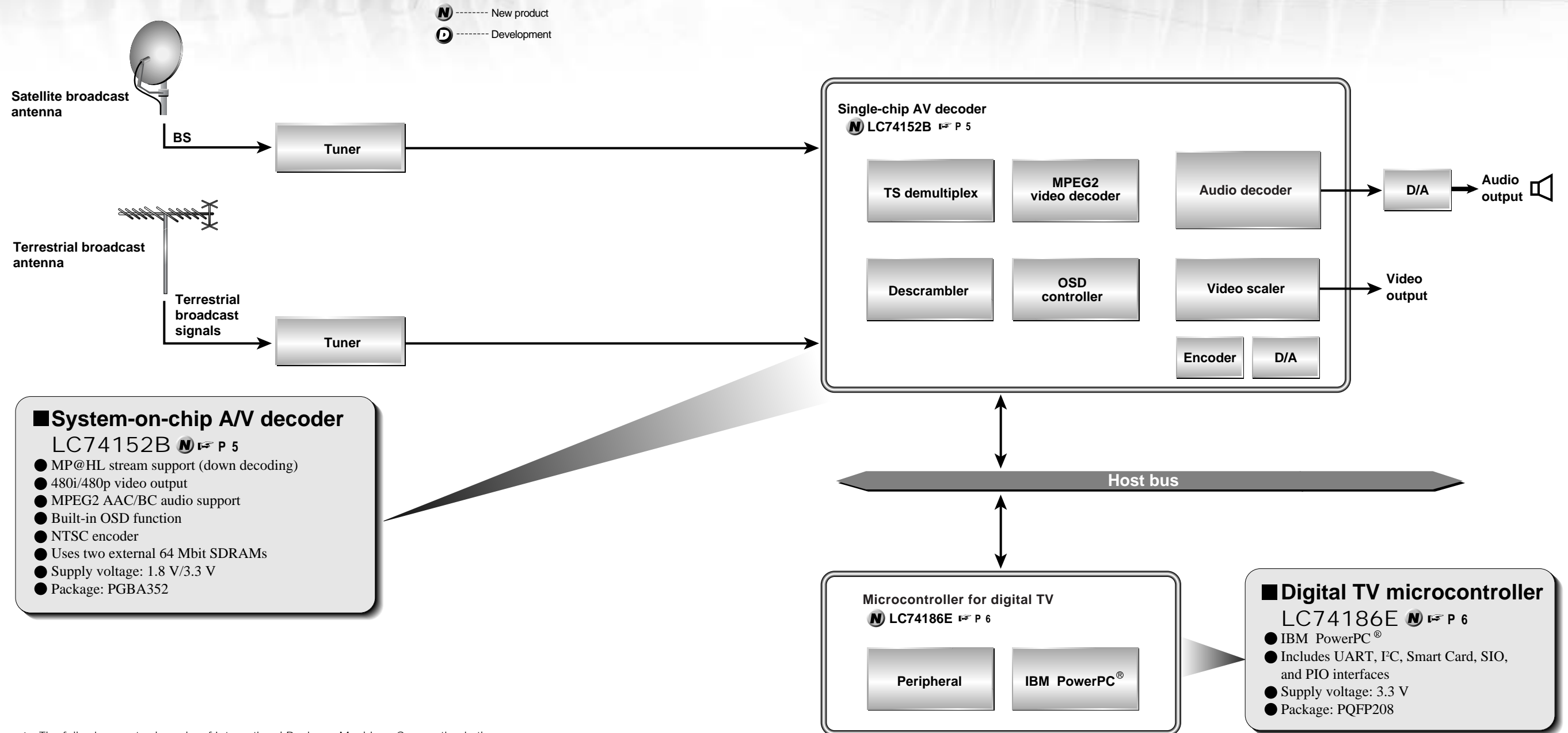
VHS Format VCR System Chip Set

These products support high quality and high reliability in end products by adopting adjustment-free technologies and furthermore integrate even more peripheral components on the same chip. This increased integration density promotes even further reductions in the required circuit board mounting area.

Digital TV Decoder System Chip Set

The world of SANYO Multimedia System Chip Sets

SANYO 480i / 480p down decoder chipsets support both digital satellite broadcast and digital terrestrial broadcast reception and are optimal for compact and popularly-priced TV sets.



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Extensive Lineup Provides Full System Support

RF amplifier transistors

- Ultrahigh frequency transistors
2SC4869, 2SC5225, 2SC5501, 2SC5503, SBFP420M

TV tuner and VCR transistors

- PicoGET Series
15GN01M, 55GN01M

Power supply system peripheral transistors

- High breakdown voltage MOSFET series
- Ultralow on-resistance MOSFET series
- Ultraminiature lightweight PicoMOS™ series
- Ultralow saturation voltage MBIT-II transistor series
- Low V_F Schottky barrier diode series
- PicoTR series

Muting circuit block

- Muting transistor series

Digital TV TS + Audio + Video Decoder IC with Built-in OSD Function

LC74152B

New product

Overview

The LC74152B is a digital TV decoder IC that integrates MPEG2 video decoder, AAC audio decoder, transport stream decoder, data broadcast OSD, video scaler, and NTSC encoder functions on the same chip.

The video decoder down decodes the HDTV stream to 480i/480p. The digital TV backend block can be implemented by combining this IC with a system controller (CPU).

Functions

[TS Decoder Block]

- Supports two TS channel inputs
- 8-bit parallel TS inputs
- Either internal or external synchronization can be selected
- Supports up to 55 indexes. The PID and channel number can be set for each index.

[Video Decoder Block]

- Down decodes the HD stream to 480i/480p
- Supports two-channel HD down decoded playback, two-channel HD down decoded plus 480p normal playback, and three-channel 480p normal playback

[Audio Decoder Block]

- MPEG AAC 5.1 channel decoding (with the output mixed down to two channels)
- MPEG BC decoding

[OSD Block]

- Supports both 480i and 480p display
- Supports both the 16 bits per pixel YUV 422 format and the 8 bits per pixel CLUT8 format

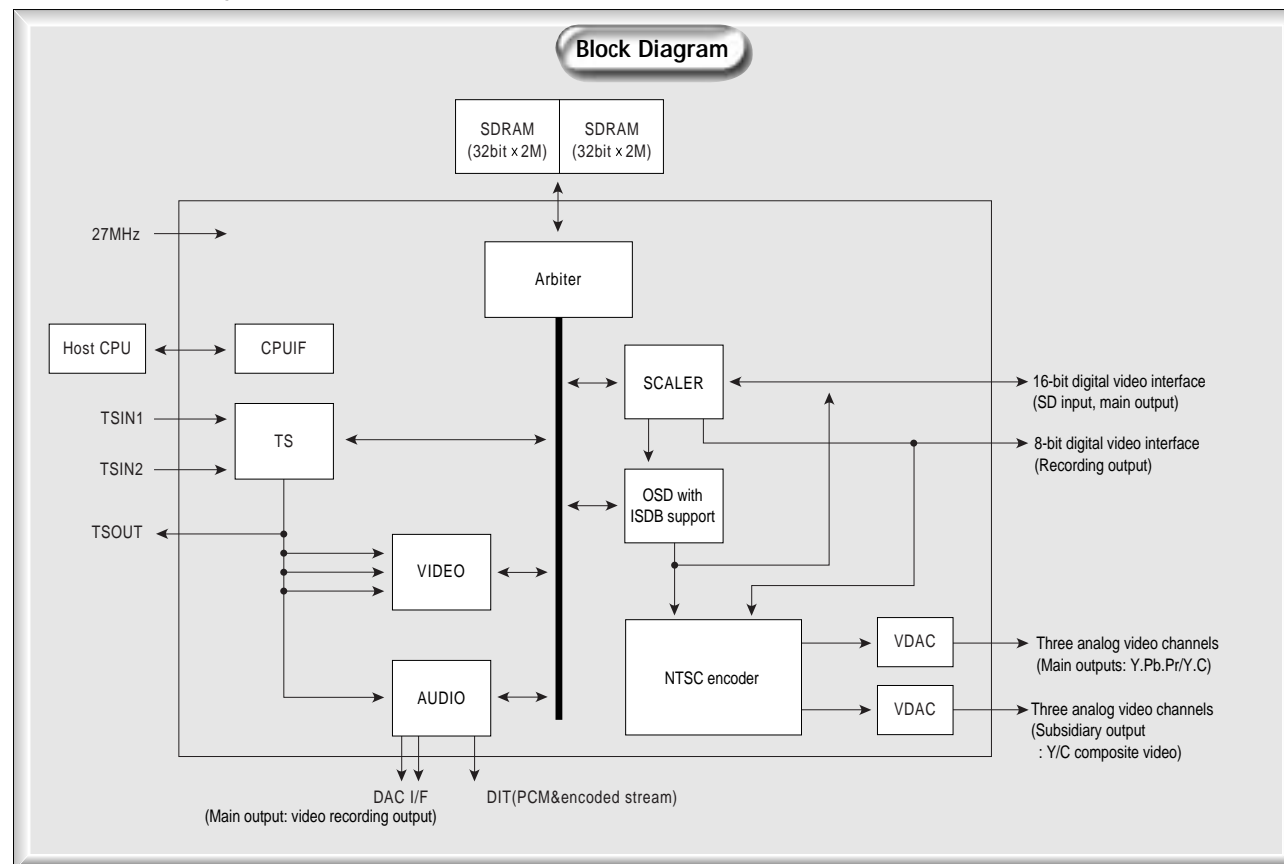
[Scaler Block]

- Two scalers are provided, supporting two-screen structures or video recording output
- Supports satellite broadcast multi-view 3-screen display

[Encoder Block]

- NTSC interlaced encoding
- Can generate two video output systems

- Supply voltage: 1.8 V (internal), 3.3 V (I/O)
- Package: PBGA352 (35 × 35)



Digital TV 32-Bit RISC Microcontroller

LC74186E

New product

Overview

The LC74186E is 32-bit microcontroller for digital TV that uses the IBM PowerPC® as its CPU core and integrates on a single chip a wide range of peripheral functions, including UART, I²C bus control, timer, synchronous serial port, parallel port, external SDRAM control, and external bus control functions.

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Functions

[IBM PowerPC® (PPC405D4)]

- Operation at clock frequencies up to 216 MHz
- 16 KB instruction cache
- 16 KB data cache

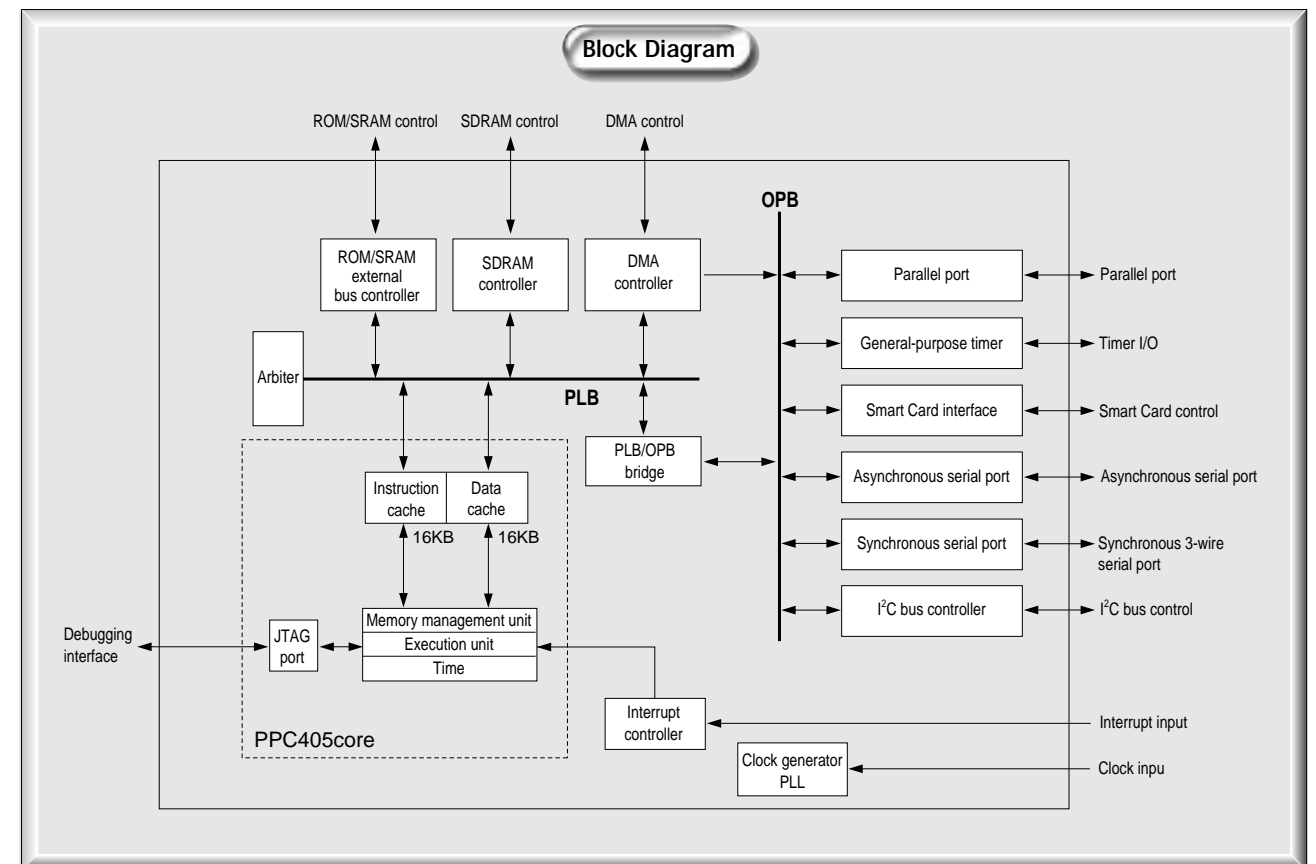
[External SDRAM Control]

- 32-bit data bus
- Support for two logical banks (two chip select signals)
- Support for 4 MB to 256 MB per logical port

[External Bus Control]

- Up to 8 ROM, EPROM, SRAM, flash, and slave peripheral I/O banks (8 CS signals)
- Support for both burst and non-burst transfer devices
- 26-bit address bus, 16-bit data bus

- SCP (synchronous serial port): 1 channel
- UART: 3 channels
- I²C bus controller: 1 channel (I²C)
- Smart Card interface: 1 channel
- General-purpose timer (GPT)
- General-purpose parallel port (GPIO)
- Interrupt controller (UIC)
- DMA controller (DMAC)
- System clock generator PLL circuit
- Supply voltage: 3.3 V
- Package: PQFP208 (0.5 mm lead pitch, 28 mm square)



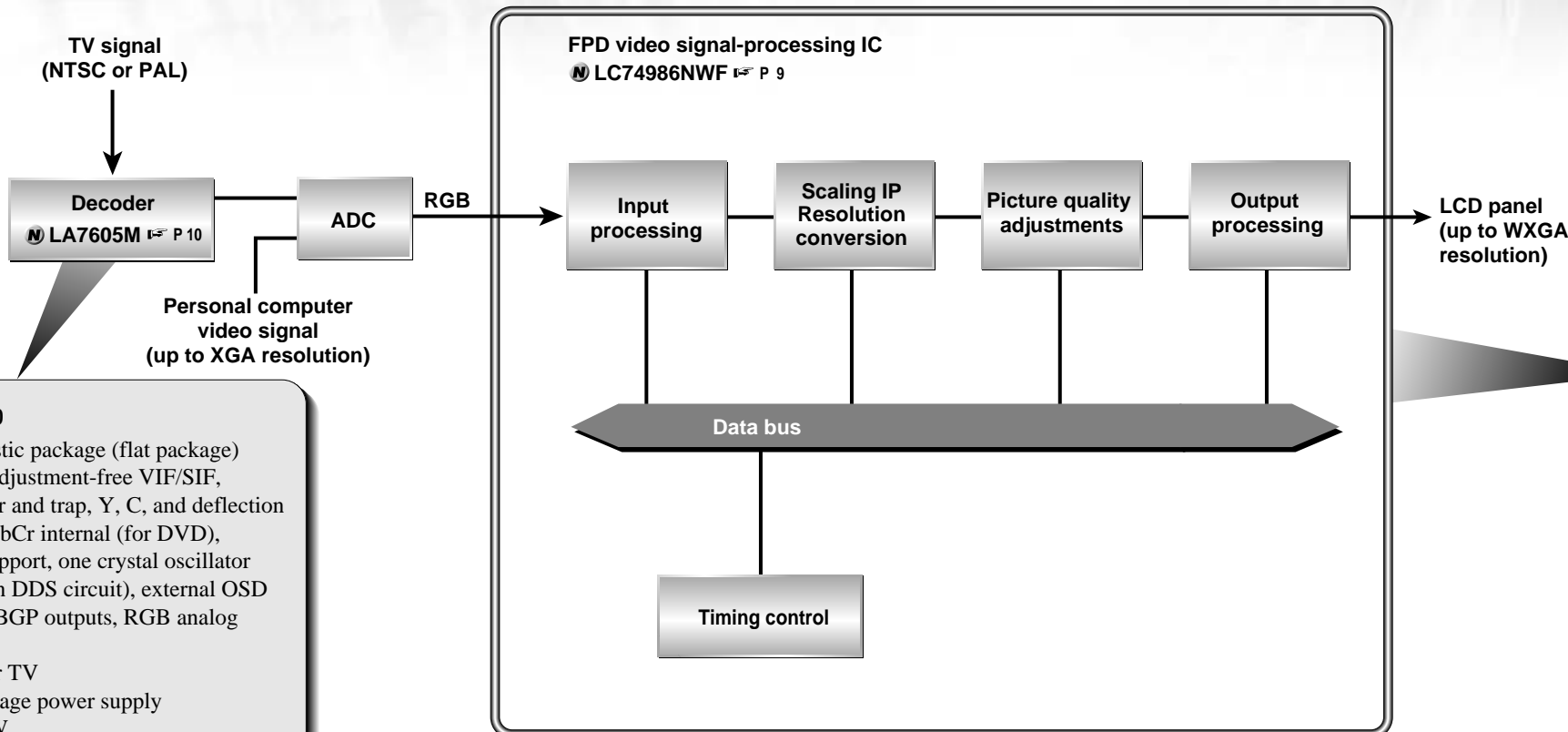
Flat Panel Display Video Signal-Processing ICs

Home AV Equipment Related Devices

SANYO has created video signal processing ICs that adopt high image quality scan converter technology and are optimal for flat panel displays.

Flat Panel Display System Chipsets Optimal for Flat Panel Displays

N New product
D Development



LA7605M **N** P 10

- Package: QIP80E (14 × 20) plastic package (flat package)
- Functions: I²C bus controller, adjustment-free VIF/SIF, audio bandpass filter and trap, Y, C, and deflection signal processing, CbCr internal (for DVD), dynamic contrast support, one crystal oscillator system (with built-in DDS circuit), external OSD input, HS, VS, and BGP outputs, RGB analog output
- Applications: PAL/NTSC color TV
- Supply voltage: 5 V single-voltage power supply
- Power consumption: About 1 W

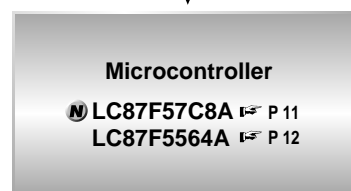


Conversion of TV signals and PC video signals to WXGA resolution using resolution conversion technology.

- Video signal processing IC for flat panel displays
LC74986NWF P 9
- Support for multiple signal sources
 - NTSC/PAL and DTV (480i/480p) inputs
 - Up to XGA progressive scan input
 - Independent enlargement in the horizontal and vertical directions. Reduction in the horizontal direction is also provided.
 - Interlaced to progressive scan conversion
 - Built-in OSD function (On-chip 510-character, 8-color, font RAM 8 characters)
 - I²C bus interface (The OSD function can also be controlled from a 3-wire bus)
 - Supply voltage: Dual-voltage supply - I/O: 3.3 V, core: 2.5 V
 - Maximum operating frequency: 85 MHz
 - Package: SQFP144 (20 × 20)

- 8-bit flash microcontroller
LC87F57C8A **N** P 11
- Flash ROM: 128 KB
 - RAM: 3,072 bytes
 - Minimum bus cycle time: 100 ns (10 MHz)
 - UART and synchronous serial port (bus compatible)
 - 12-channel 8-bit A/D converter
 - PWM: Two variable period 12-bit PWM circuits
 - Package: QIP64E (14 × 14), SQFP64 (10 × 10)

- 8-bit flash microcontroller
LC87F5564A P 12
- Flash ROM: 64 KB
 - RAM: 1,024 bytes
 - Minimum bus cycle time: 100 ns (10 MHz)
 - UART and synchronous serial port (bus compatible)
 - 12-channel 8-bit A/D converter
 - PWM: Two variable period 12-bit PWM circuits
 - Package: QIP48E (14 × 14), SQFP48 (7 × 7)



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Extensive Lineup Provides Full System Support

- AC/DC Converter Transistors
High breakdown voltage MOSFET series
2SK2624LS, 2SK2625LS, 2SK2628LS

- DC/DC Converter Transistors
Low saturation voltage transistors
CPH3115, CPH3109
Ultralow on-resistance MOSFETs
FSS140, FS132, FS134, CPH3314, CPH3414
Ultraminiature light weight PicoMOS™ series
2.5V drive: VDSS=30V system, N-channel and P-channel devices
2.5V drive: VDSS=50V system, N-channel and P-channel devices
4.0V drive: VDSS=50V system, N-channel and P-channel devices

- Diodes
SBS004, SBS005, SBS006, SBE001, SBE002

- Backlight Inverter Transistors
Low saturation voltage transistors
2SC5566, 2SC5706, 2SC5707, CPH3216, CPH3205, CPH3212, CPH3223, CPH3115, CPH3109, CPH3116, 2SA2039
Dual device single package products (PNP × 2)
CPH5503, CPH5504, CPH5506, CPH5508
Dual device single package products (PNP + NPN)
CPH5506
MOSFETs
FW332, FW351, FW238, FW256

Scan Converter IC for Flat Panel Displays

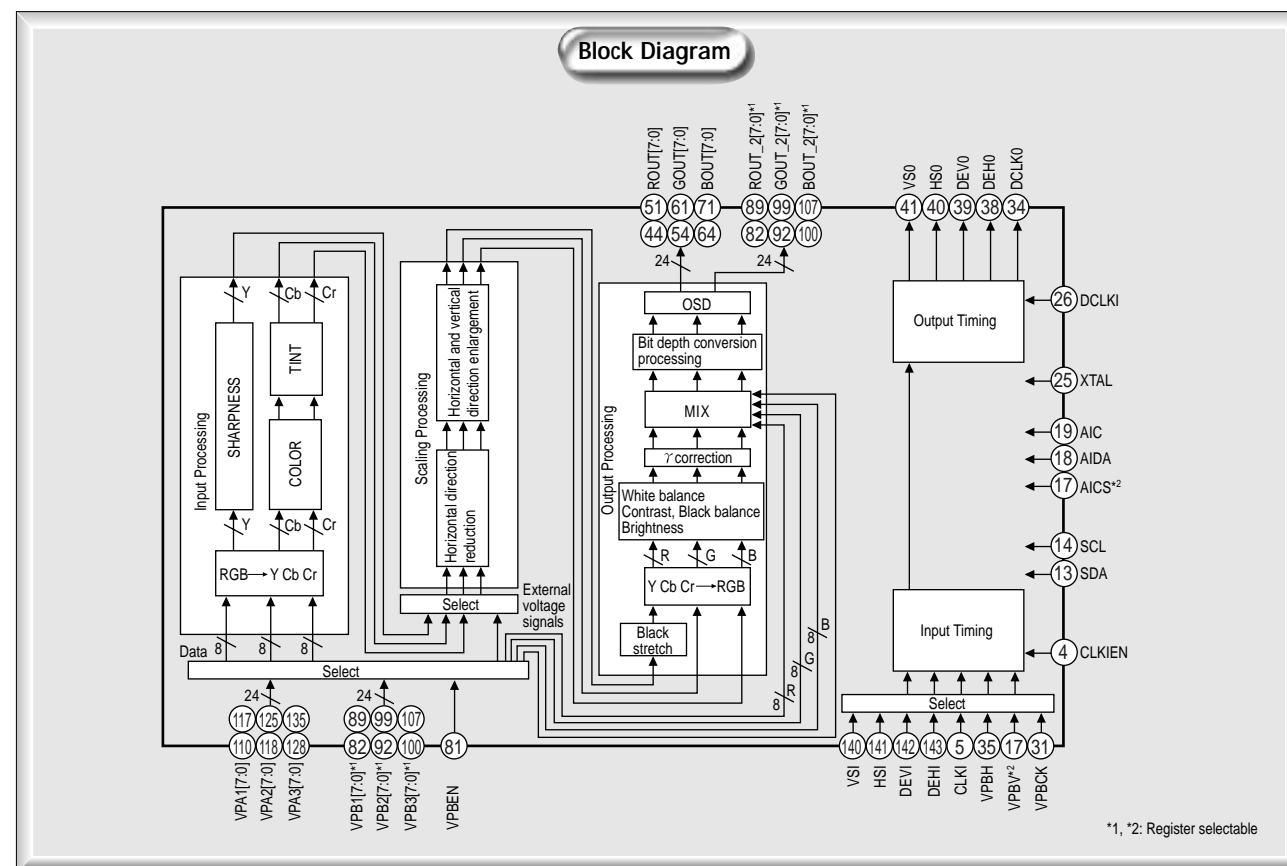
LC74986NWF New product

Overview

The LC74986NWF is a video signal processing IC that performs resolution conversion, IP conversion, and image quality corrections without requiring external memory. It can convert and display a wide variety of video signal formats for display on a flat panel display. In particular, its image quality correction function adjusts the image quality to be optimal for display on a flat panel. Its OSD function can display characters with a size optimal for the panel used. A video signal processing system for flat panel displays can be implemented easily by combining this IC with video converter, A/D converter, and microcontroller ICs and an LCD panel.

Functions

- NTSC/PAL and DTV (480i/480p) inputs: YCbCr digital 8-bit signal inputs
- Up to WXGA progressive scan input: RGB digital 8-bit signal input
- Independent enlargement in the horizontal and vertical directions. Reduction in the horizontal direction is also provided.
- Interlaced to progressive scan conversion
- Image quality adjustment function (sharpness, color, tint, black stretch, brightness, contrast, white balance, black balance)
- γ correction circuit (Look-up table system. Common characteristics for each 8-bit RGB color can be programmed.)
- Single RGB 24-bit or 18-bit signal output or dual RGB 48-bit or 36-bit signal output (with built-in bit depth simulation and conversion functions)
- No external frame memory required (Input and output have the same frame period)
- Built-in OSD function (On-chip 510-character 8-color, font RAM 8 characters)
- I²C bus interface (The OSD function can also be controlled from a 3-wire bus)
- Supply voltage: Dual-voltage supply - I/O: 3.3 V, core: 2.5 V
- Maximum operating frequency: 85 MHz
- Package: SQFP144 (20 × 20)



Video Signal Processor

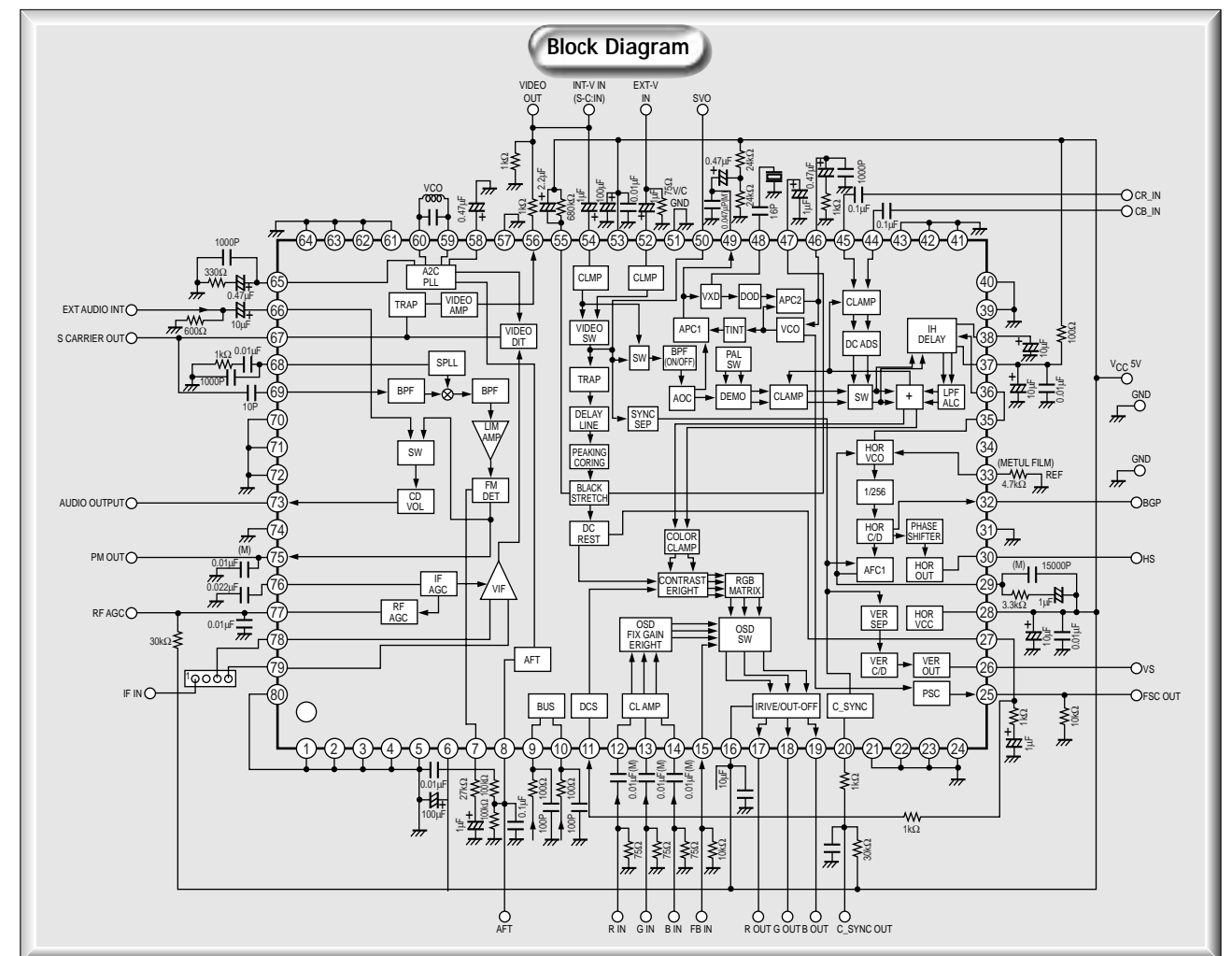
LA7605M New product

Overview

The LA7605M is a flat panel display color TV signal-processing I²C bus controller IC that supports all the broadcast standards used worldwide.

Functions and Features

- VIF/SIF bloc
 - Adjustment-free VCO, 4-mode audio trap/audio bandpass filter, buzz canceller
 - RF AGC/video level
- Single crystal color system: PAL and NTSC
- Black stretch, sharpness control with coring on/off control, built-in variable Y system filters (Y-DL and chrominance trap)
- Chrominance bandpass filter, demodulation ratio/angle control, support for CbCr input
- VS, HS, and BGP outputs, C-sync output, FSC output
- Dynamic contrast control
- VIF, SIF, video, and sync separator circuits with superlative weak field and nonstandard signal characteristics
- Adjustment-free VIF/SIF, audio trap, and audio bandpass filters
- Horizontal resonator-less adjustment-free system
- Supply voltage: VCC: 5 V
- Package: QIP80E (14 × 20)



8-Bit Flash Microcontroller

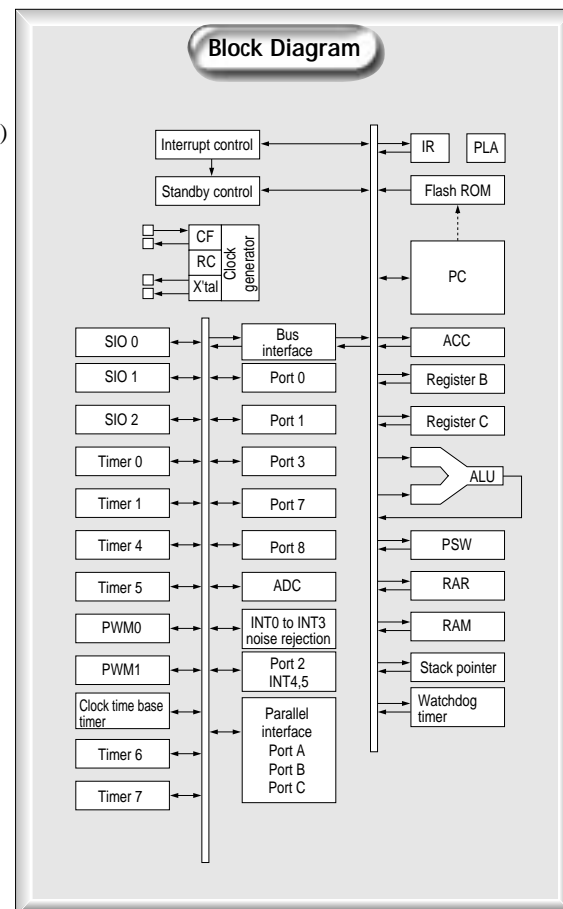
LC87F57C8A New product

Overview

The LC87F57C8A is an 8-bit microcontroller built around a CPU block that operates with a minimum bus cycle time of 100 ns and that integrates 128 KB of flash ROM (that supports onboard programming), 4 KB of RAM, and an extensive set of peripheral functions on a single chip. The peripheral functions include two multifunction 16-bit timer/counters (that can be used as separate 8-bit counters), four 8-bit timers with prescalers, a clock time base timer, two synchronous SIO channels that provide an automatic transfer function, one asynchronous/synchronous SIO channel, two 12-bit PWM circuits, a 12-channel 8-bit A/D converter, a high-speed 8-bit parallel interface, a high-speed clock counter, a system clock divider function, and an interrupt function that supports 20 interrupts and 10 vector locations.

Functions

- **Timers**
 - One 16-bit timer/counter with capture register (can also be used as two 8-bit timers)
 - One 16-bit timer/counter with PWM/toggle output function (can also be used as two 8-bit timers)
 - Four 8-bit timers with 6-bit prescaler function
 - Clock time base timer
- **High-speed clock counter**
(Can count a clock signal up to 20 MHz when a 10 MHz main clock frequency is used.)
- **SIO**
 - Two 8-bit SIO channels with automatic transfer function
 - Two 8-bit baud rate generators included
 - Maximum clock: 4/3 tCYC
 - One 8-bit asynchronous/synchronous SIO channel
 - Asynchronous: 8 to 2048 tCYC, Synchronous: 2 to 512 tCYC
- **A/D converter: 12-channel 8-bit converter**
- **PWM: two variable-period 12-bit PWM circuits**
- **Parallel interface (switchable polarity, can perform read and write operations in 1 tCYC)**
- **Remote control receiver (using the P73/INT3/T0IN shared function pin)**
- **Watchdog timer (Uses an external RC circuit)**
- **Interrupts**
 - 20 interrupt sources with 10 vector locations (Multiple interrupts supported using three interrupt levels: low level (L), high level (H), and maximum level (X))
- **High-speed multiply and divide instructions**
 - 16 bits × 8 bits (Execution time: 5 tCYC)
 - 24 bits × 16 bits (Execution time: 12 tCYC)
 - 16 bits ÷ 8 bits (Execution time: 8 tCYC)
 - 24 bits ÷ 16 bits (Execution time: 12 tCYC)
- **System clock divider function**
- **Standby functions**
 - Halt mode: instruction execution stopped, peripheral circuit operation continues
 - Hold mode: instruction execution stopped, peripheral circuit operation stopped
 - Crystal hold mode: instruction execution stopped, peripheral circuit operation stopped except for the clock time base timer
- **Package: QIP64E (14 × 14), SQFP64 (10 × 10)**



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8-Bit Flash Microcontroller

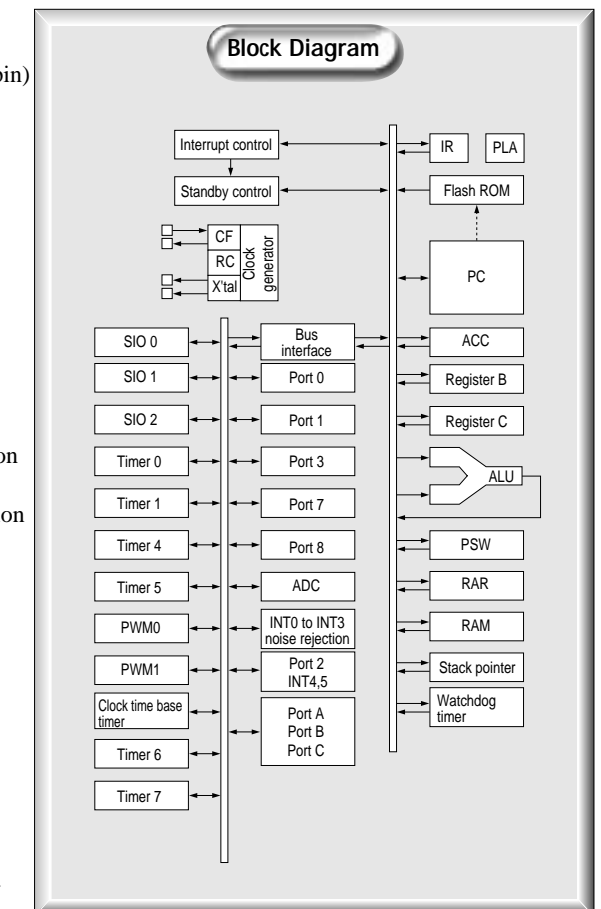
LC87F5564A

Overview

The LC87F5564A is an 8-bit microcontroller built around a CPU block that operates with a minimum bus cycle time of 100 ns and that integrates 64 KB of flash ROM (that supports onboard programming), 1 KB of RAM, and an extensive set of peripheral functions on a single chip. multifunction 16-bit timer/counters (that can be used as separate 8-bit counters), four 8-bit timers with prescalers, a clock time base timer, two synchronous SIO channels that provide an automatic transfer function, one asynchronous/synchronous SIO channel, two 12-bit PWM circuits, a 12-channel 8-bit A/D converter, a high-speed 8-bit parallel interface, a high-speed clock counter, a system clock divider function, and an interrupt function that supports 20 interrupts and 10 vector locations.

Functions

- **Timers**
 - One 16-bit timer/counter with capture register (can also be used as two 8-bit timers)
 - One 16-bit timer/counter with PWM/toggle output function (can also be used as two 8-bit timers)
 - Four 8-bit timers with 6-bit prescaler function
 - Clock time base timer
- **High-speed clock counter**
(Can count a clock signal up to 20 MHz when a 10 MHz main clock frequency is used.)
- **SIO**
 - Two 8-bit SIO channels with automatic transfer function
 - Two 8-bit baud rate generators included
 - Maximum clock: 4/3 tCYC
 - One 8-bit asynchronous/synchronous SIO channel
 - Asynchronous: 8 to 2048 tCYC, Synchronous: 2 to 512 tCYC
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 - 16 bits ÷ 8 bits (Execution time: 8 tCYC)
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- **System clock divider function**
- **Standby functions**
 - Halt mode: instruction execution stopped, peripheral circuit operation continues
 - Hold mode: instruction execution stopped, peripheral circuit operation stopped
 - Crystal hold mode: instruction execution stopped, peripheral circuit operation stopped except for the clock time base timer
- **Package: QIP48E (14 × 14), SQFP48 (7 × 7)**



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Color TV Bus System Chip Set

The world of SANYO Multimedia System Chip Sets

SANYO supports end product design and manufacture appropriate for all markets with a full product line of color TV I²C bus control system ICs.

Full lineup of system ICs that feature I²C bus control

Full lineup that responds to market needs

■ PAL multiformat I²C bus control system ICs

LA76810 Series

LA76818A **N** P 19

(PAL/NTSC, YCbCr)

LA76828N **N** P 20

(PAL/NTSC, E/W, YCbCr)

LA76835A **N** P 21

(NTSC, E/W support)

LA76835NM **D** P 22

(NTSC, E/W, YCbCr)

LA76843N **N** P 23

(NTSC)

- Adjustment-free VIF/SIF
- Built-in trap and bandpass filter
- Single crystal chrominance system
- Built-in horizontal period (1H) delay line
- Supply voltage: VCC = 5 V/9 V
- Package: DIP54S (600mil)

■ Signal-processing ICs with built-in microcontroller (CPU + VCD)

LA76919M **N** P 17

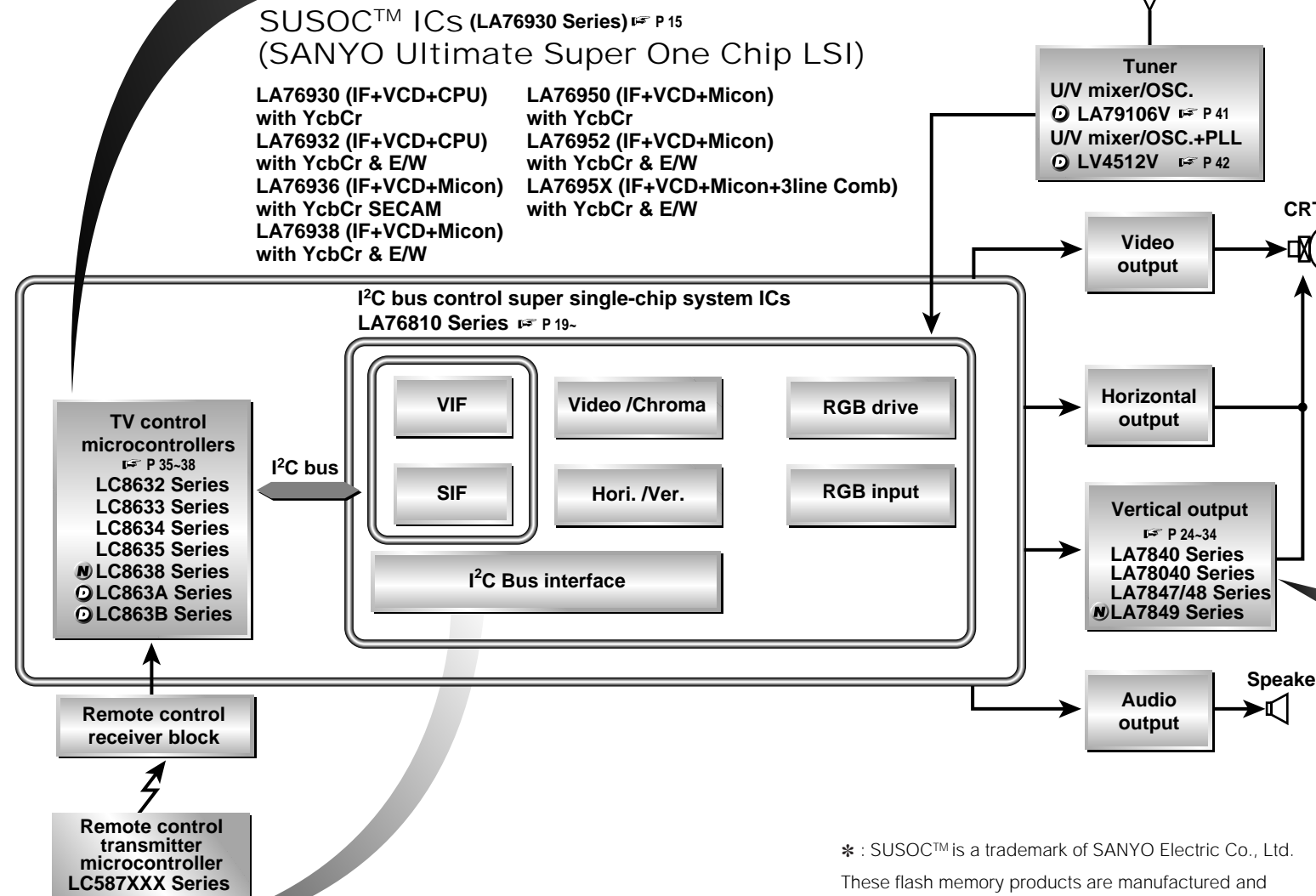
(NTSC)

LA76922M **N** P 18

(NTSC E/W YCbCr)

- Built-in microcontroller TV signal-processing ICs
- VCC = 5 V or 9 V
- TV signal-processing functions
- TV system control microcontroller

N ----- New product
D ----- Development



SUSOC™ ICs (LA76930 Series) P 15 (SANYO Ultimate Super One Chip LSI)

LA76930 (IF+VCD+CPU) with YcbCr
LA76932 (IF+VCD+CPU) with YcbCr & E/W
LA76936 (IF+VCD+Micon) with YcbCr SECAM
LA76938 (IF+VCD+Micon) with YcbCr & E/W

LA76950 (IF+VCD+Micon) with YcbCr
LA76952 (IF+VCD+Micon) with YcbCr & E/W
LA7695X (IF+VCD+Micon+3line Comb) with YcbCr & E/W

I²C bus control super single-chip system ICs LA76810 Series P 19-

I²C Bus Control for TV Signal-Processing ICs P 35-38

■ TV Control Microcontrollers LC8632 Series, LC8633 Series LC8634 Series, LC8635 Series LC838 Series

- ROM: 12 to 64 KB
- RAM: 512 to 640 bytes
- Caption data slicer (LC8632/LC8634 Series)
- Simple graphics function OSD
- Multi-master I²C bus system
- ROM correction function
- On-chip flash memory microcontrollers for evaluation
- Packages: DIP42S (600mil), QIP48E (14x 14) (LC8632/33 Series)
DIP36S (400mil), MFP36SDJ (375mil) (LC8634/35 Series)
DIP42S (600mil), QIP48E (14x 14) (LC838 Series)

Full Lineup of I²C Bus Vertical Output ICs P 29-

■ LA7840/41/45N/46N/75/76 78040N/O40/O41/O45

- High reliability
- Low power consumption

Type No.	Package	θ_{j-c}	Output voltage (max)	Output current	VCC	P
LA7840	SIP7H	4.0°C/W	70V	1.8A _{PP}	16 to 33V	24
LA7841	SIP7H	4.0°C/W	70V	2.2A _{PP}	16 to 33V	25
LA7845N	SIP7H	4.0°C/W	85V	2.2A _{PP}	16 to 38V	26
LA7846N	SIP10H	3.0°C/W	85V	3.0A _{PP}	16 to 38V	27
LA7875N	SIP10HD	4.0°C/W	110V	2.2A _{PP}	16 to 33V	32
LA7876N	SIP10H	3.0°C/W	110V	3.0A _{PP}	16 to 33V	32
LA78040N	T0220-7H	3.0°C/W	70V	1.8A _{PP}	16 to 33V	29
LA78040	T0220-7H	3.0°C/W	70V	1.8A _{PP}	16 to 33V	28
LA78041	T0220-7H	3.0°C/W	70V	2.2A _{PP}	16 to 33V	30
LA78045	T0220-7H	3.0°C/W	92V	2.2A _{PP}	16 to 43V	31

On-Chip I²C Bus and E/W Driver Circuits

■ LA7847, LA7848, LA7849 **N**

- For large-screen and flat-screen CRT TVs

Type No.	Package	θ_{j-c}	Output voltage (max)	Output current	VCC	P
LA7847	SIP10HD	4.0°C/W	72V	2.2A _{PP}	16 to 34V	33
LA7848	SIP10HD	4.0°C/W	92V	2.2A _{PP}	16 to 43V	33
LA7849	SIP10H	3.0°C/W	92V	2.2A _{PP}	16 to 43V	34

* : SUSOC™ is a trademark of SANYO Electric Co., Ltd.

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Extensive Lineup Provides Full System Support

Remote control transmitter microcontrollers

- 4-bit system-on-chip microcontrollers: LC587XXX series
- Built-in LCD display circuit: 92 to 140 segments
- ROM capacity: 2K×16 bits to 8K×16 bits
- 4-bit system-on-chip microcontrollers: LC573400 series
- Built-in LCD display circuit: Up to 120 segments
- ROM capacity: 4K or 6K×8 bits

Flash microcontrollers LC58F7416A **N** lineup

- 4-bit system-on-chip microcontrollers: LC573100 series
- Optimal for low-end remote controls that do not require LCD display
- ROM capacity: 1K, 2K, or 4K×8 bits

VHF/UHF Tuner Transistors

- High-frequency MOSFET series
- High-frequency transistor series (f_T=1 to 6 GHz)
- PicoGET series

Video Transistors

- Horizontal deflection output transistor series
- Video output transistor series
- Ultralow on-resistance MOSFETs

Power Supply System Transistors

- High breakdown voltage MOSFET series
- Ultralow on-resistance MOSFET series
- Ultraminiature light weight PicoMOS™ series
- Ultralow saturation voltage MBIT-II transistor series
- Low V_f Schottky barrier diode series
- PicoTR series

Built-in CTV Microcontroller Signal-Processing System ICs

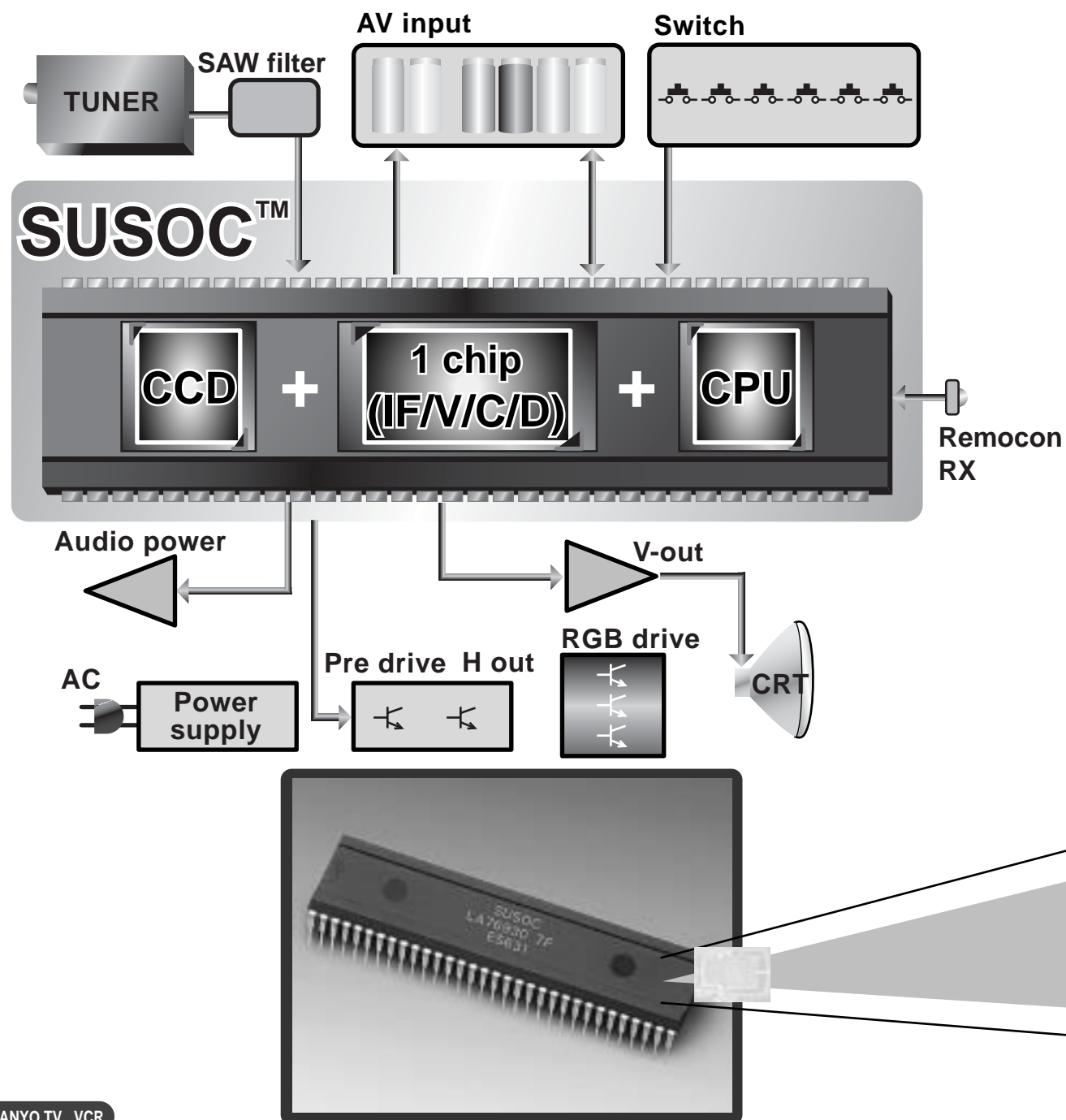
SUSOC™ LA76930 Series

Support for Worldwide Markets with All-in-One ICs

A newly-developed signal-processing IC, a microcontroller, and even a CCD.
There is no one other than SANYO who has included so much functionality in a single package.
Additionally, series deployment with pin-to-pin compatibility* means that users can handle TV signal standards in different markets around the world by changing only certain specific components.

These ICs, which SANYO has named SUSOC™ (SANYO Ultimate Super One Chip), provide powerful support for design and manufacturing for all markets.

* : This allows different models to be used with essentially no changes to the pin layout.



Features

■ General features

- Complete lineup that covers all markets worldwide
- Global pin-to-pin series (multiformat, PAL/NTSC, NTSC)

■ VIF/SIF

- Adjustment-free VIF/SIF
- No VCO coil required
- Built-in audio bandpass filter, four-system audio trap
- Digital AFT system

■ V/C/D (Video/Chrominance/Deflection)

- Blue stretching technology that creates high-quality images
- DDS technology single crystal VCO system
- DVD component signal inputs (YCbCr)
- Built-in SECAM demodulator (LA76936, LA76938)
- Special architecture and algorithms that create high-quality images

■ CPU

- Up to 15 colors can be selected
- Four colors per character

SUSOC ICs (LA76930Series)

LA76930 (IF+VCD+CPU) with YcbCr	LA76950 (IF+VCD+Micon) with YcbCr
LA76932 (IF+VCD+CPU) with YcbCr & E/W	LA76952 (IF+VCD+Micon) with YcbCr & E/W
LA76936 (IF+VCD+Micon) with YcbCr SECAM	LA7695X (IF+VCD+Micon+3line Comb) with YcbCr & E/W
LA76938 (IF+VCD+Micon) with YcbCr & E/W	

* : SUSOC™ is a trademark of SANYO Electric Co., Ltd.

Signal-Processing IC with Integrated Microcontroller

LA76919M

New product

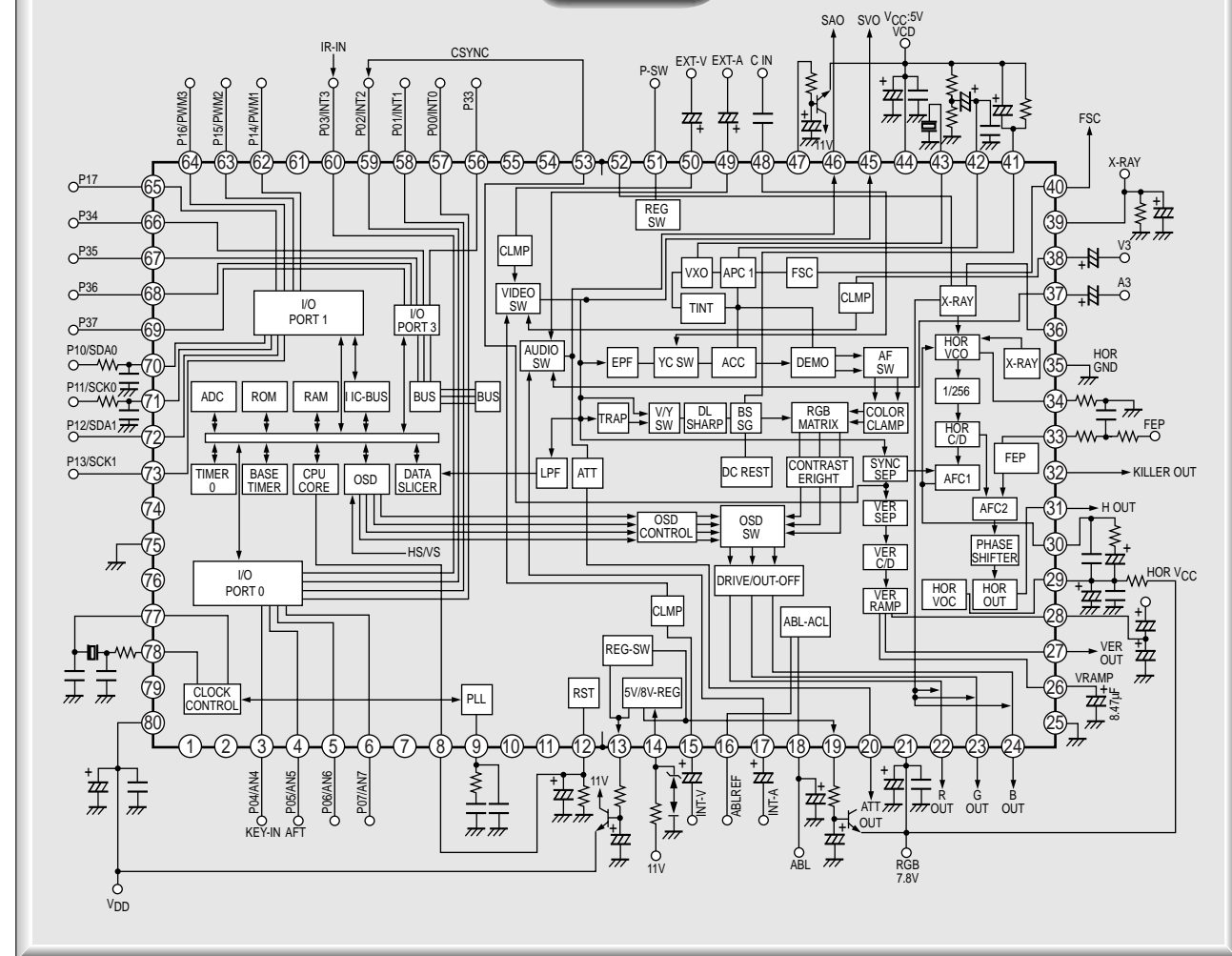
Overview

The LA76919M and LA76922M series are I²C bus controller ICs that support the NTSC format and aim for rationalization of color TV set design, improved manufacturability, and lower total costs.

Functions and Features

- Black stretch, sharpness control with coring on/off control, built-in variable Y system filters (Y-DL and chrominance trap)
- Chrominance bandpass filter, demodulation angle control
- Audio and video switching: three systems
- Built-in microcontroller video, chrominance, and deflection signal processing
- Adjustment-free horizontal resonator system
- Simplified SG
- Supply voltage: V_{CC} = 11 V (built-in reference voltage for 5.7 V and 8.5 V regulators)
- Package: QIP80E (14 × 20)

Block Diagram



Signal-Processing IC with Integrated Microcontroller

LA76922M

New product

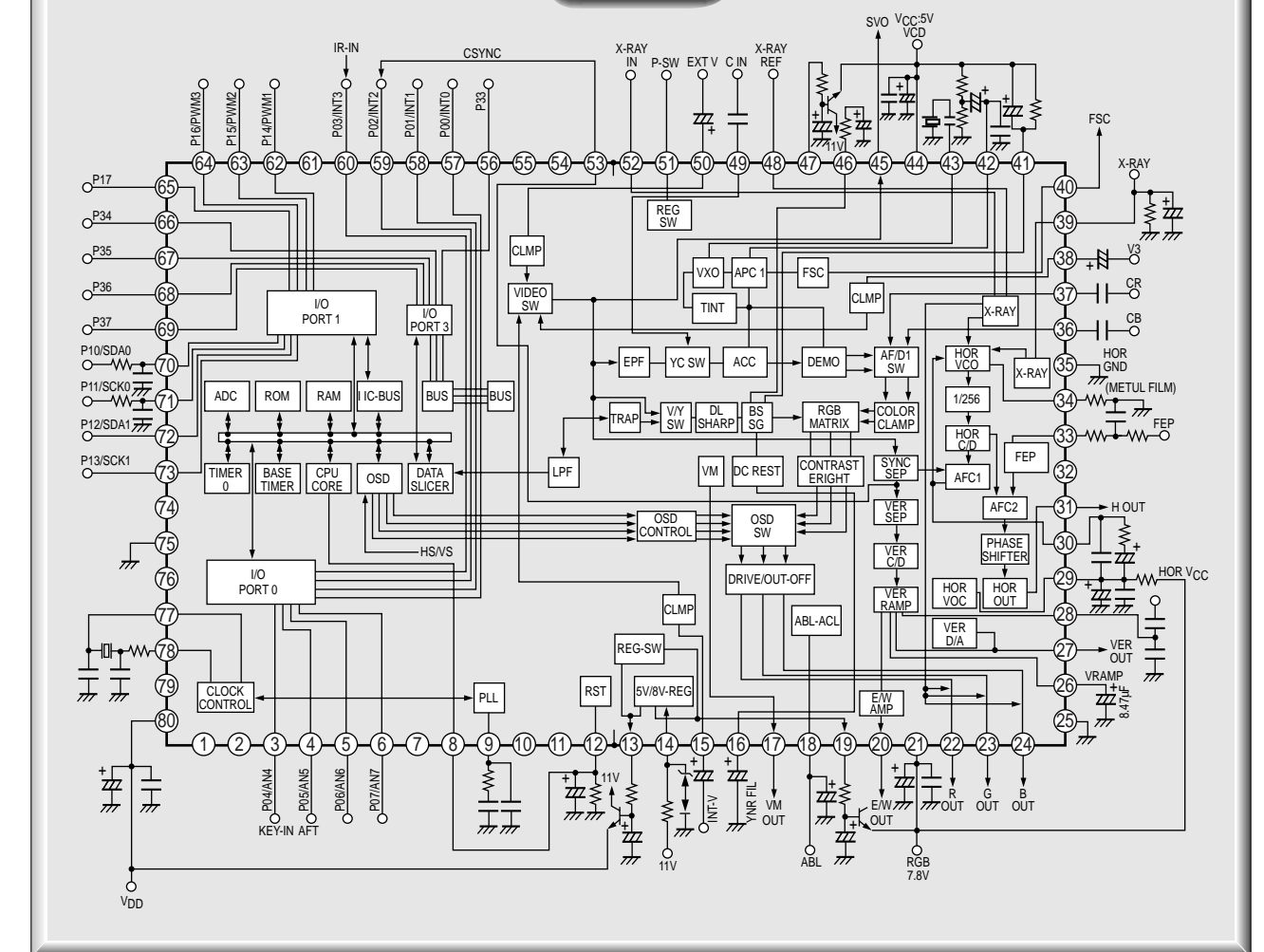
Overview

The LA76919M and LA76922M series are I²C bus controller ICs that support the NTSC format and aim for rationalization of color TV set design, improved manufacturability, and lower total costs.

Functions and Features

- Black stretch, sharpness control with coring on/off control, built-in variable Y system filters (Y-DL and chrominance trap)
- Chrominance bandpass filter, demodulation angle control, CbCr input
- E/W support
- VM output
- Audio and video switching: three systems
- Built-in microcontroller video, chrominance, and deflection signal processing
- Adjustment-free horizontal resonator system
- Simplified SG
- Supply voltage: V_{CC} = 11 V (built-in reference voltage for 5.7 V and 8.5 V regulators)
- Package: QIP80E (14 × 20)

Block Diagram



I²C Bus Control Lineup LA76810 Series

LA76818A

New product

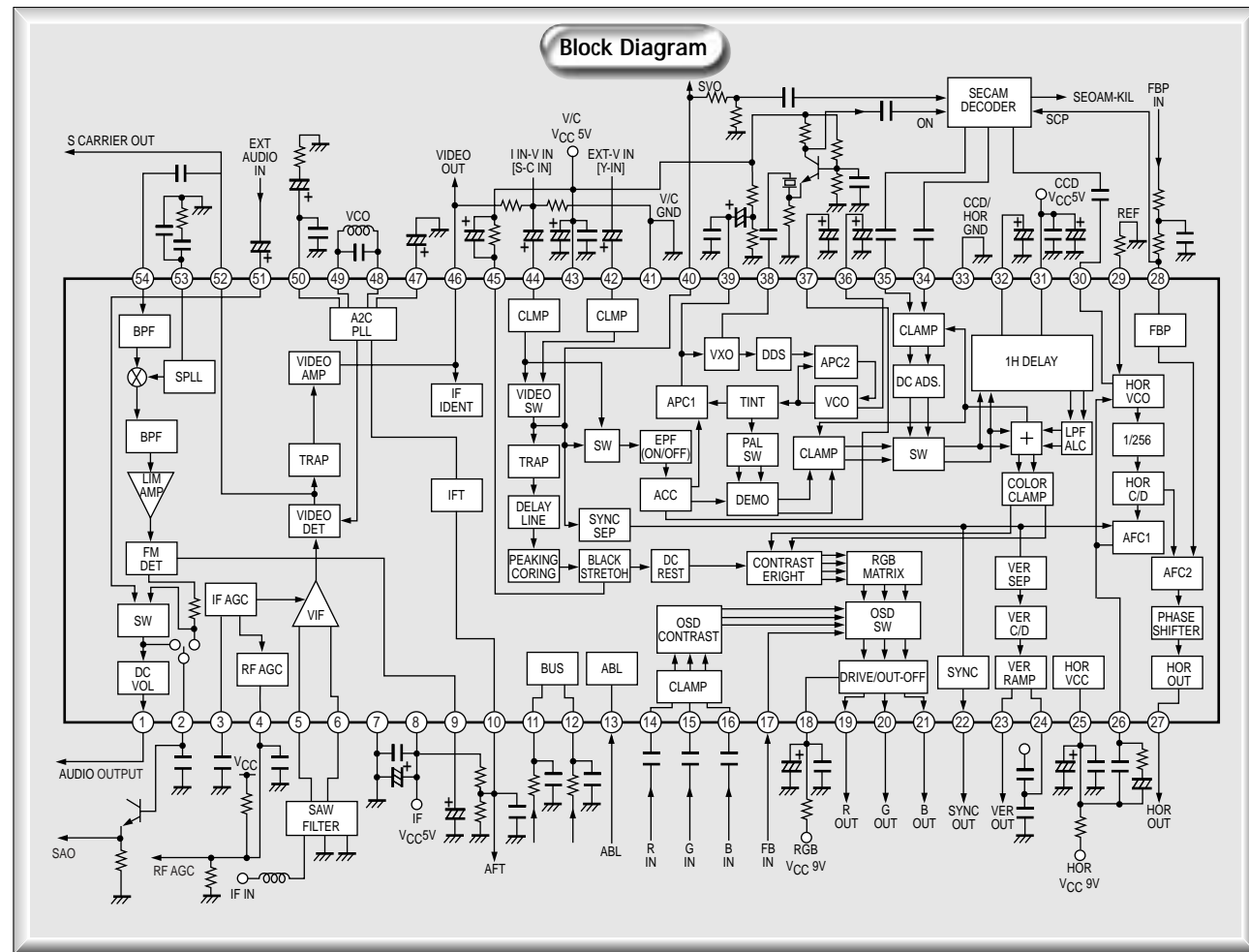
Overview

The LA76810 series are I²C bus controller ICs that support the different TV broadcast formats used worldwide and aim for rationalization of color TV set design, improved manufacturability, and lower total costs

- Single crystal multifORMAT system that supports the different TV broadcast formats used worldwide
- ICs optimal for each individual broadcast standard deployed as a pin-to-pin compatible lineup
 - MultifORMAT system: LA76818A (YCbCr support), LA76828N (YCbCr and E/W support)
 - NTSC system: LA76843N/LA76835A (YCbCr and E/W support), LA76835NM (YCbCr and E/W support)
- Adjustment-free VIF/SIF, audio trap/audio bandpass filters
- Adjustment-free horizontal resonator system
- Simplified SG
- Supply voltage: V_{CC} = 5 V/9 V
- Package: DIP54S (600mil), QIP80E (14 × 20) (LA76835NM only)

Functions and Features

- VIF/SIF
 - Adjustment-free VCO, 4-mode audio trap/audio bandpass filter, buzz canceller
 - RF AGC/video level
 - SIF system automatic discrimination (The LA7973 is used as the automatic discrimination IC.)
- Single crystal color system: PAL, NTSC, SECAM (The LA7642N is used as the SECAM decoder.)
- Black stretch, sharpness control with coring on/off control, built-in variable Y system filters (Y-DL and chrominance trap)
- Chrominance bandpass filter, demodulation ratio and angle control



I²C Bus Control Lineup LA76810 Series

LA76828N

New product

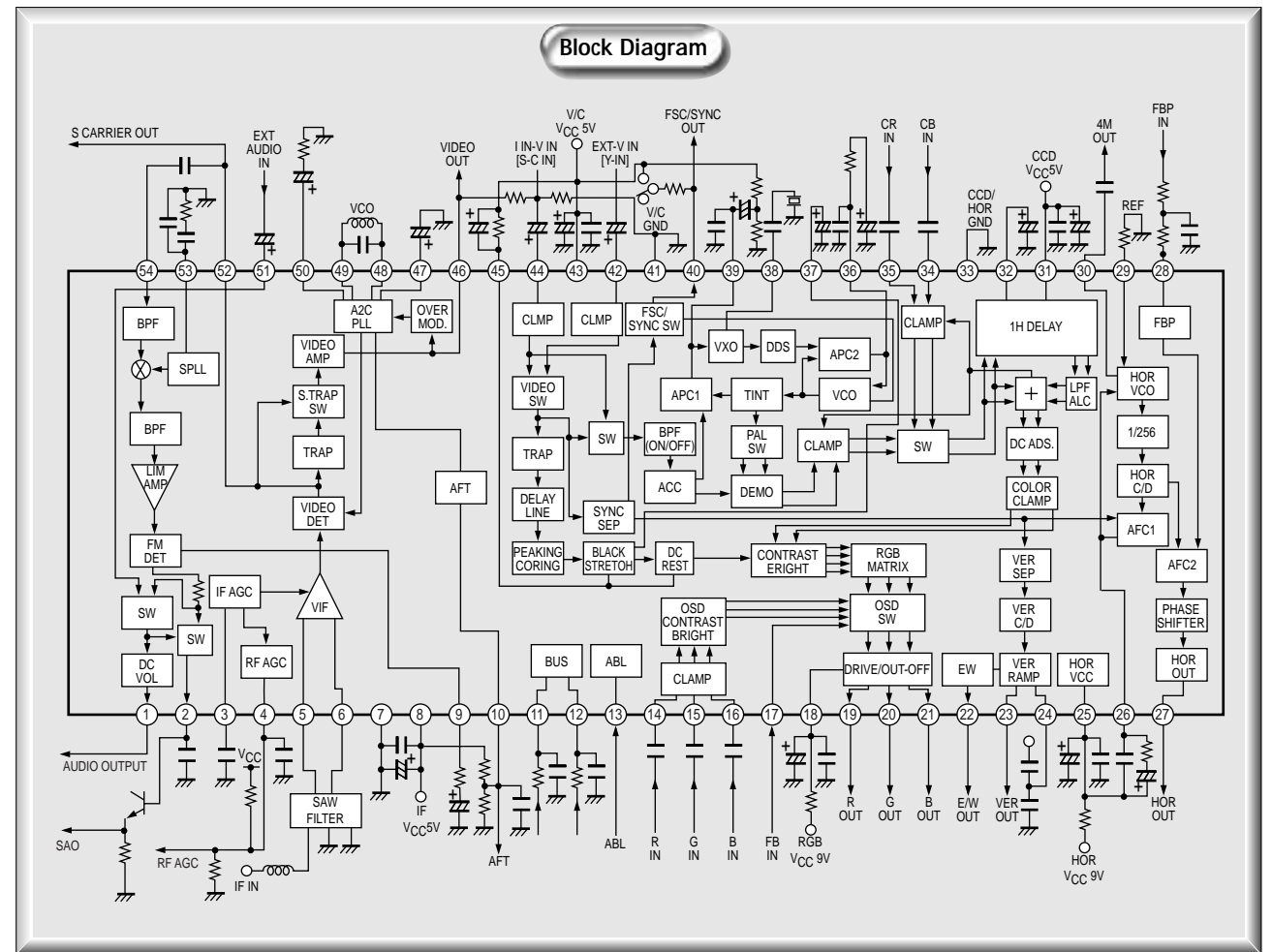
Overview

The LA76810 series are I²C bus controller ICs that support the different TV broadcast formats used worldwide and aim for rationalization of color TV set design, improved manufacturability, and lower total costs

- Single crystal multifORMAT system that supports the different TV broadcast formats used worldwide
- ICs optimal for each individual broadcast standard deployed as a pin-to-pin compatible lineup
 - MultifORMAT system: LA76818A (YCbCr support), LA76828N (YCbCr and E/W support)
 - NTSC system: LA76843N/LA76835A (YCbCr and E/W support), LA76835NM (YCbCr and E/W support)
- Adjustment-free VIF/SIF, audio trap/audio bandpass filters
- Adjustment-free horizontal resonator system
- Simplified SG
- Supply voltage: V_{CC} = 5 V/9 V
- Package: DIP54S (600mil), QIP80E (14 × 20) (LA76835NM only)

Functions and Features

- VIF/SIF
 - Adjustment-free VCO, 4-mode audio trap/audio bandpass filter, buzz canceller
 - RF AGC/video level
 - SIF system automatic discrimination (The LA7973 is used as the automatic discrimination IC.)
- Single crystal color system: PAL, NTSC, SECAM (The LA7642N is used as the SECAM decoder.)
- Black stretch, sharpness control with coring on/off control, built-in variable Y system filters (Y-DL and chrominance trap)
- Chrominance bandpass filter, demodulation ratio and angle control
- E/W support



I²C Bus Control Lineup LA76810 Series

LA76835A

New
product

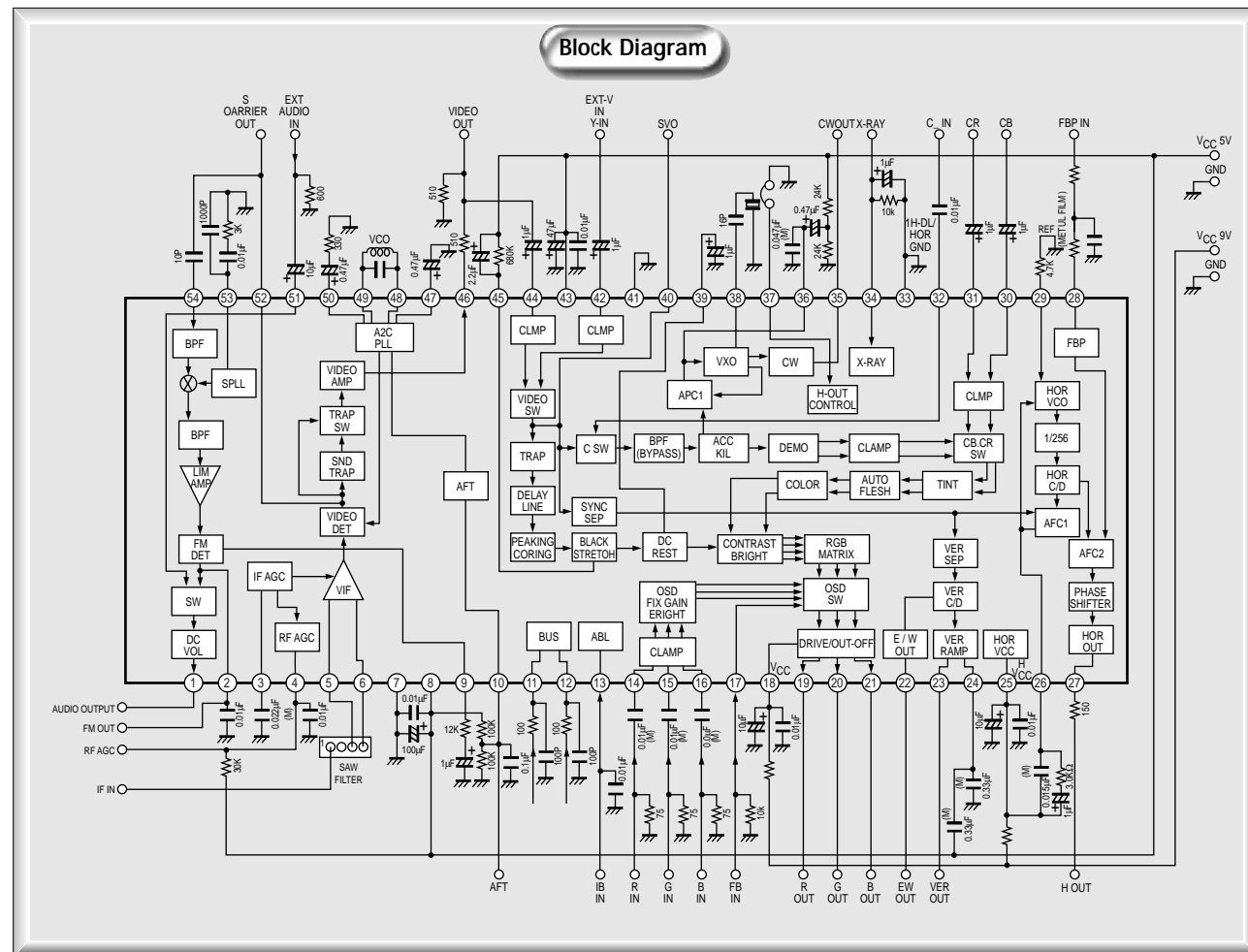
Overview

The LA76810 series are I²C bus controller ICs that support the different TV broadcast formats used worldwide and aim for rationalization of color TV set design, improved manufacturability, and lower total costs.

- Single crystal multifomat system that supports the different TV broadcast formats used worldwide.
- ICs optimal for each individual broadcast standard deployed as a pin-to-pin compatible lineup.
 - Multifomat system: LA76818A (YCbCr support), LA76828N (YCbCr and E/W support)
 - NTSC system: LA76843N/LA76835A (YCbCr and E/W support), LA76835NM (YCbCr and E/W support)
- Adjustment-free VIF/SIF, audio trap/audio bandpass filters
- Adjustment-free horizontal resonator system
- Simplified SG
- Supply voltage: V_{CC} = 5 V/9 V
- Package: DIP54S (600mil), QIP80E (14 × 20) (LA76835NM only)

Functions and Features

- VIF/SIF
 - Adjustment-free VCO, buzz canceller
 - RF AGC/video level/FM level control
- Black stretch, sharpness control with coring on/off control, built-in variable Y system filters (Y-DL and chrominance trap)
- Chrominance bandpass filter, demodulation angle control
- E/W support



I²C Bus Control Lineup LA76810 Series

LA76835NM

Development

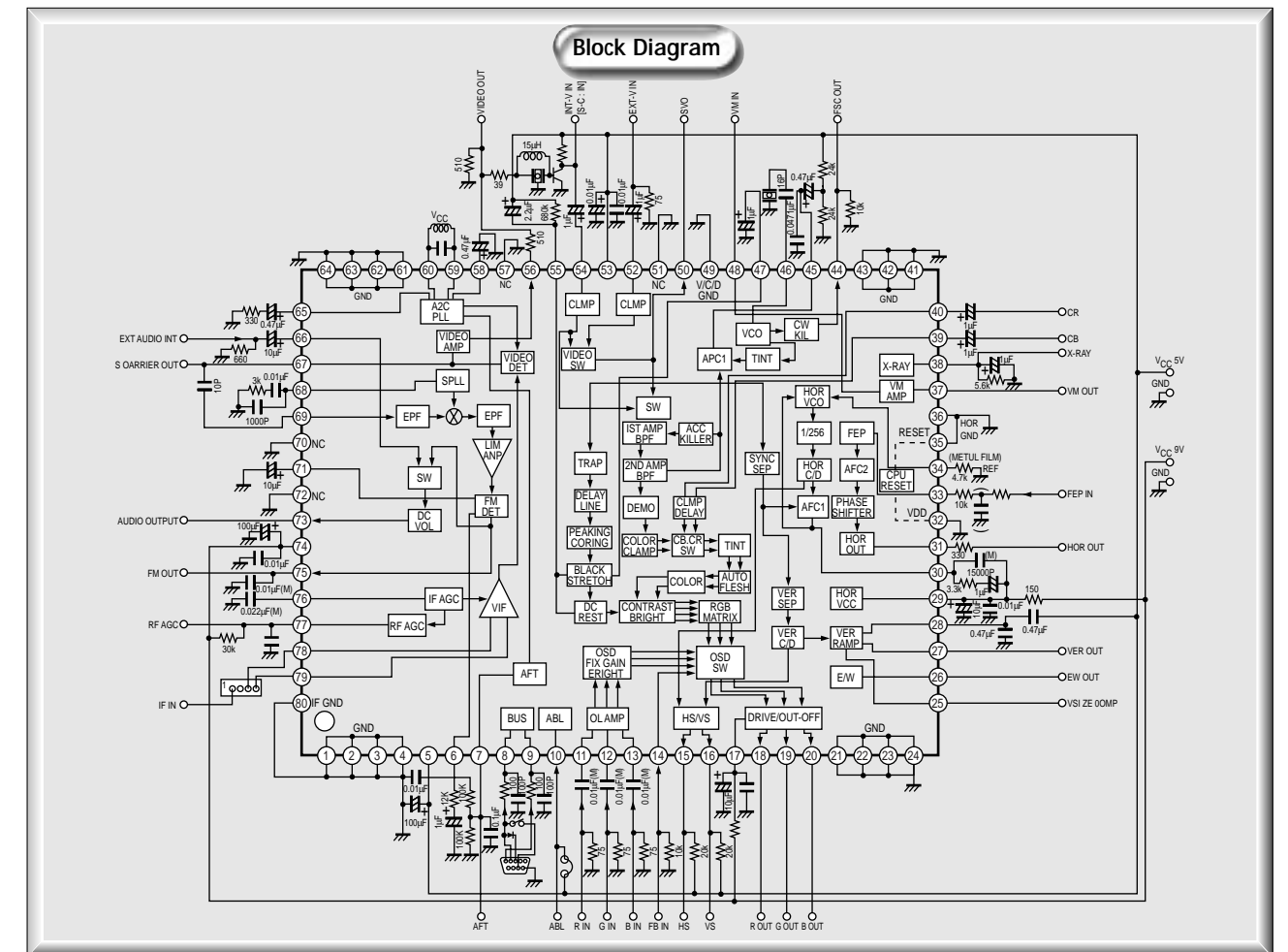
Overview

The LA76810 series are I²C bus controller ICs that support the different TV broadcast formats used worldwide and aim for rationalization of color TV set design, improved manufacturability, and lower total costs.

- Single crystal multifomat system that supports the different TV broadcast formats used worldwide.
- ICs optimal for each individual broadcast standard deployed as a pin-to-pin compatible lineup.
 - Multifomat system: LA76918A (YCbCr support), LA76828N (YCbCr and E/W support)
 - NTSC system: LA76843N/LA76835A (YCbCr and E/W support), LA76835NM (YCbCr and E/W support)
- Adjustment-free VIF/SIF, audio trap/audio bandpass filters
- Adjustment-free horizontal resonator system
- Simplified SG
- Supply voltage: V_{CC} = 5 V/9 V
- Package: DIP54S (600mil), QIP80E (14 × 20) (LA76835NM only)

Functions and Features

- VIF/SIF
 - Adjustment-free VCO, buzz canceller
 - RF AGC/video level/FM level control
- Black stretch, sharpness control with coring on/off control, built-in variable Y system filters (Y-DL and chrominance trap)
- Chrominance bandpass filter, demodulation ratio and angle control, blue stretch
- E/W support



I²C Bus Control Lineup LA76810 Series

LA76843N

New product

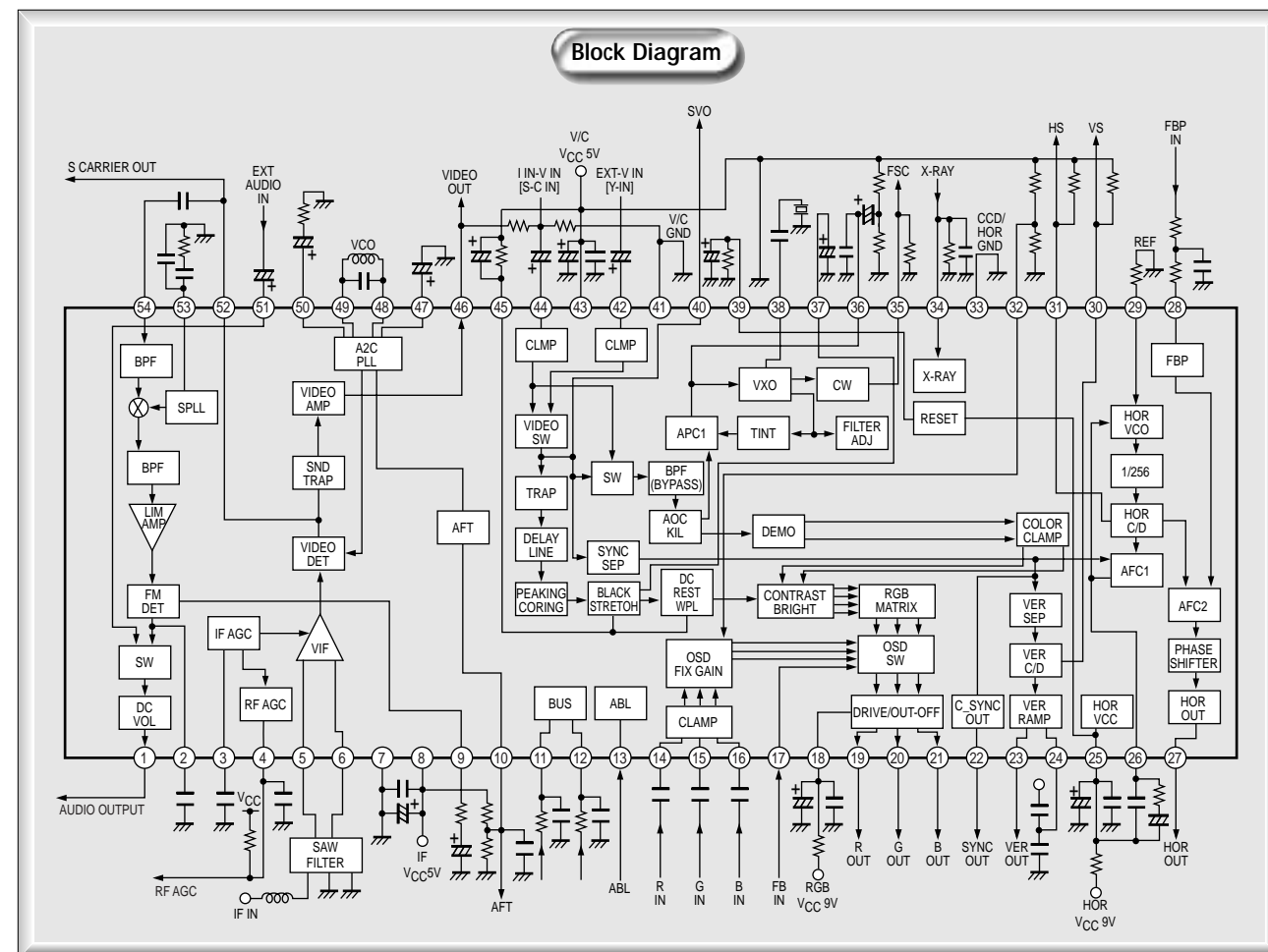
Overview

The LA76810 series are I²C bus controller ICs that support the different TV broadcast formats used worldwide and aim for rationalization of color TV set design, improved manufacturability, and lower total costs

- Single crystal multiformat system that supports the different TV broadcast formats used worldwide
- ICs optimal for each individual broadcast standard deployed as a pin-to-pin compatible lineup
 - Multiformat system: LA76818A (YCbCr support), LA76828N (YCbCr and E/W support)
 - NTSC system: LA76843N/LA76835A (YCbCr and E/W support), LA76835NM (YCbCr and E/W support)
- Adjustment-free VIF/SIF, audio trap/audio bandpass filters
- Adjustment-free horizontal resonator system
- Simplified SG
- Supply voltage: V_{CC} = 5 V/9 V
- Package: DIP54S (600mil), QIP80E (14 × 20) (LA76835NM only)

Functions and Features

- VIF/SIF
 - Adjustment-free VCO, buzz canceller
 - RF AGC/video level/FM level control
- Black stretch, sharpness control with coring on/off control, built-in variable Y system filters (Y-DL and chrominance trap)
- Chrominance bandpass filter, demodulation angle control



Vertical Output IC

LA7840

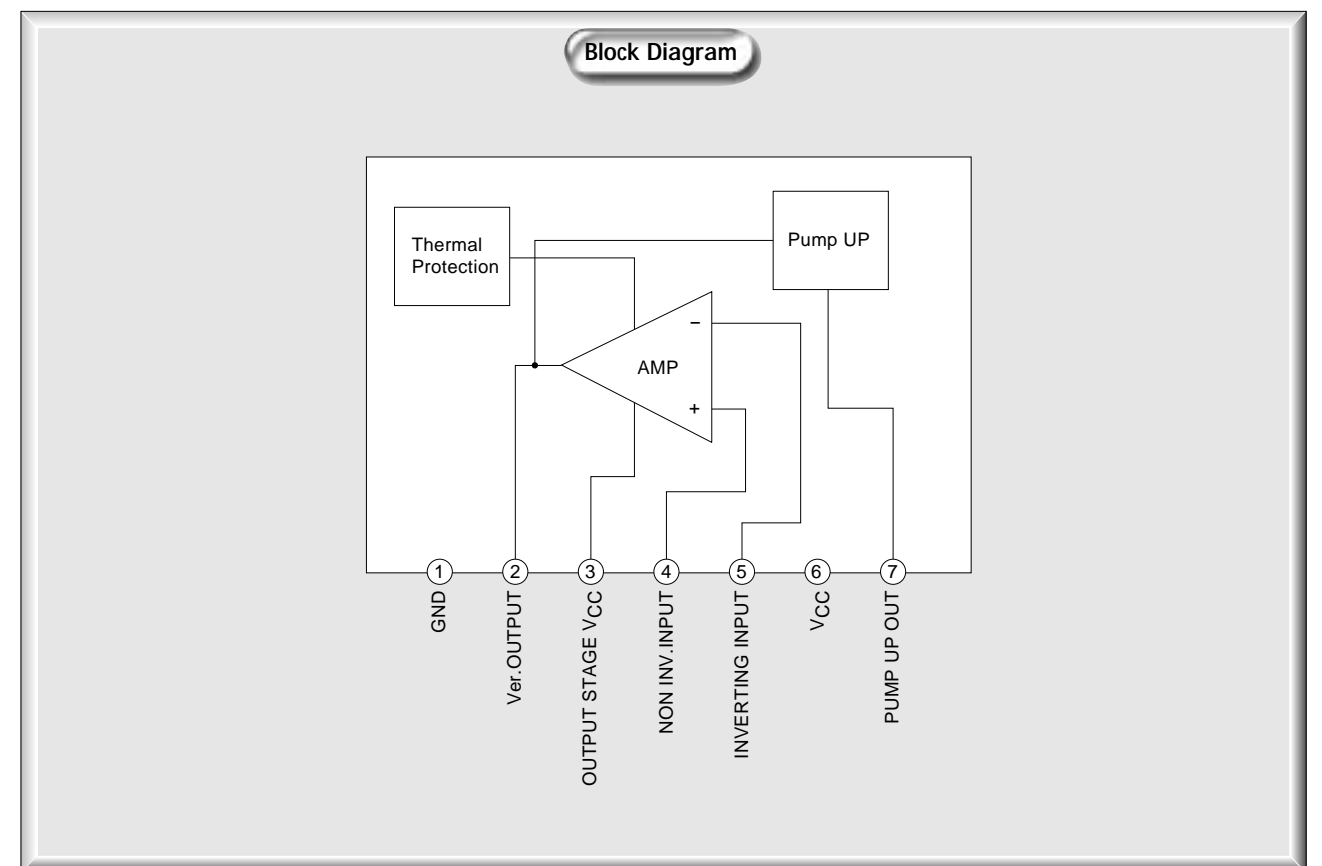
Overview

The LA7840 is a vertical deflection output IC for high-definition TV and CRT displays in systems that use a bus control system signal-processing IC. This IC can directly drive (including the DC component) the deflection yoke from the sawtooth wave output from the bus control system signal-processing IC. The color TV vertical deflection system adjustment function can be controlled from the bus system when this IC is used in conjunction with a SANYO LA768X or LA769XX series TV bus control system signal-processing IC.

The LA7840 provides a maximum deflection current of 1.8 A p-p, and thus is optimal for small to medium diameter CRTs.

Functions

- Low power operation achieved by using integrated charge pump circuit
- Vertical output circuit
- Thermal protection circuit
- Excellent crossover characteristics
- Supports DC coupling
- Package: SIP7H



Vertical Output IC

LA7841

Overview

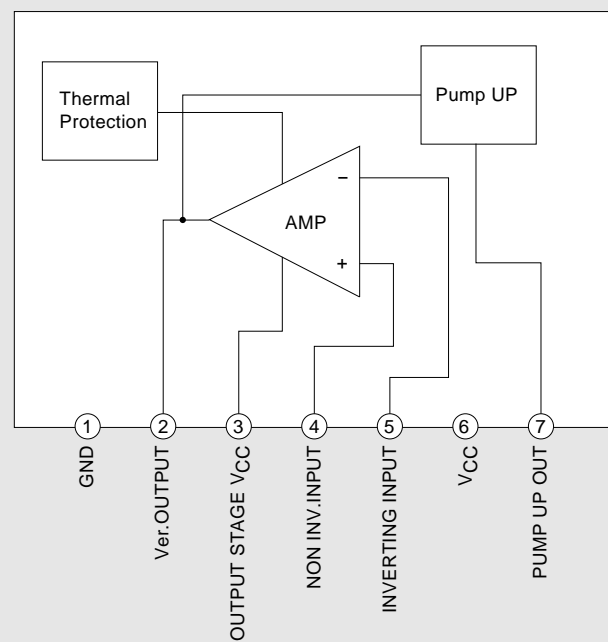
The LA7841 is a vertical deflection output IC for high-definition TV and CRT displays in systems that use a bus control system signal-processing IC. This IC can directly drive (including the DC component) the deflection yoke from the sawtooth wave output from the bus control system signal-processing IC. The color TV vertical deflection system adjustment function can be controlled from the bus system when this IC is used in conjunction with a SANYO LA768X or LA769XX series TV bus control system signal-processing IC.

The LA7841 provides a maximum deflection current of 2.2 A p-p, and thus is optimal for large diameter CRTs.

Functions

- Low power operation achieved by using integrated charge pump circuit
- Vertical output circuit
- Thermal protection circuit
- Excellent crossover characteristics
- Supports DC coupling
- Package: SIP7H

Block Diagram



Vertical Output IC

LA7845N

Overview

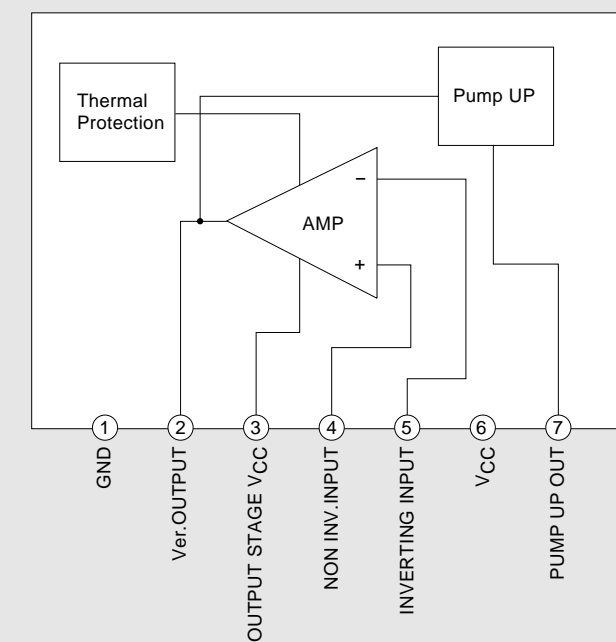
The LA7845N is a vertical deflection output IC for high-definition TV and CRT displays in systems that use a bus control system signal-processing IC. This IC can directly drive (including the DC component) the deflection yoke from the sawtooth wave output from the bus control system signal-processing IC. The color TV vertical deflection system adjustment function can be controlled from the bus system when this IC is used in conjunction with a SANYO LA768X or LA769XX series TV bus control system signal-processing IC.

The LA7845N provides a maximum deflection current of 2.2 A p-p, and thus is optimal for large diameter CRTs, and can drive the CRTs used in TV sets in the 33 to 37 inch range.

Functions

- Low power operation achieved by using integrated charge pump circuit
- Vertical output circuit
- Thermal protection circuit
- Excellent crossover characteristics
- Supports DC coupling
- Package: SIP7H

Block Diagram



Vertical Output IC

LA7846N

Overview

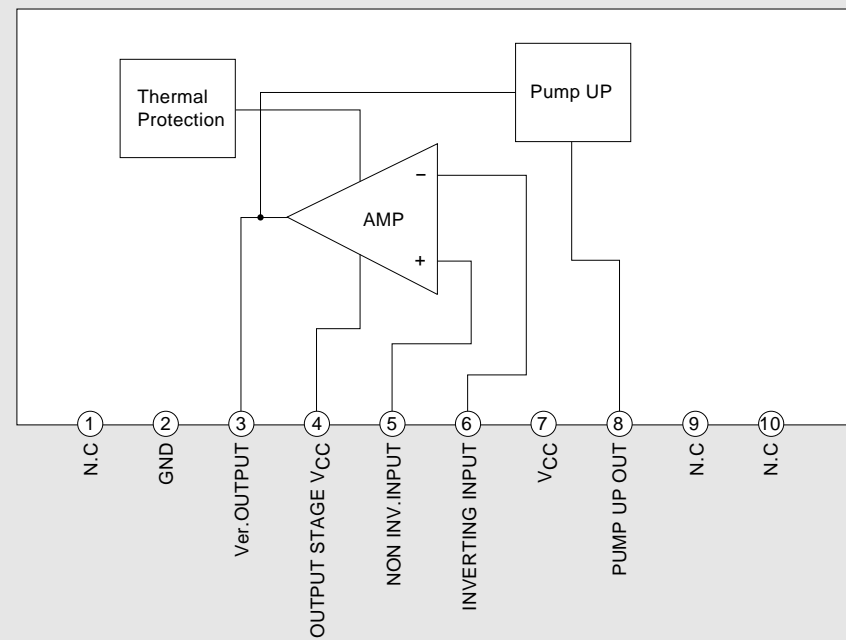
The LA7846N is a vertical deflection output IC for high-definition TV and CRT displays in systems that use a bus control system signal-processing IC. This IC can directly drive (including the DC component) the deflection yoke from the sawtooth wave output from the bus control system signal-processing IC. The color TV vertical deflection system adjustment function can be controlled from the bus system when this IC is used in conjunction with a Sanyo LA768X or LA769XX series TV bus control system signal-processing IC.

The LA7846N provides a maximum deflection current of 3.0 A p-p, and thus is optimal for large diameter CRTs, and can drive the CRTs used in TV sets in the 33 to 37 inch range.

Functions

- Low power operation achieved by using integrated charge pump circuit
- Vertical output circuit
- Thermal protection circuit
- Excellent crossover characteristics
- Supports DC coupling
- Package: SIP10H

Block Diagram



Vertical Output IC

LA78040

Overview

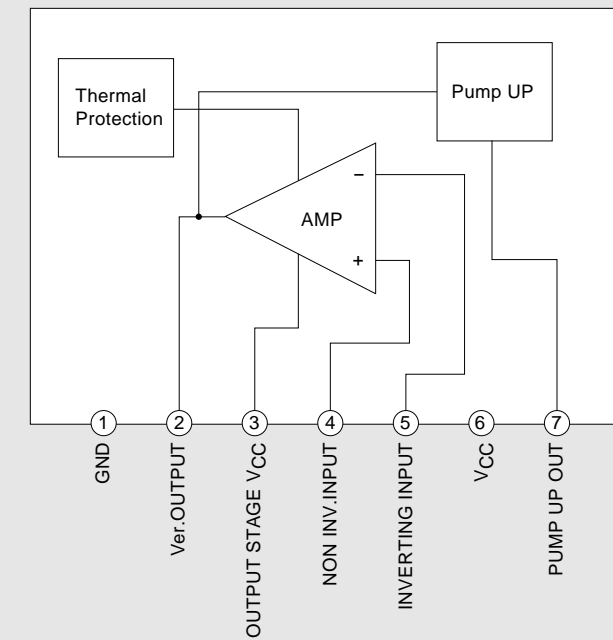
The LA78040 is a vertical deflection output IC for high-definition TV and CRT displays in systems that use a bus control system signal-processing IC. This IC can directly drive (including the DC component) the deflection yoke from the sawtooth wave output from the bus control system signal-processing IC. The color TV vertical deflection system adjustment function can be controlled from the bus system when this IC is used in conjunction with a SANYO LA768X or LA769XX series TV bus control system signal-processing IC.

The LA78040 provides a maximum deflection current of 1.8 A p-p, and thus is optimal for small to medium diameter CRTs.

Functions

- Low power operation achieved by using integrated charge pump circuit
- Vertical output circuit
- Thermal protection circuit
- Excellent crossover characteristics
- Supports DC coupling
- Package: TO220-7H

Block Diagram



Vertical Output IC

LA78040N

Overview

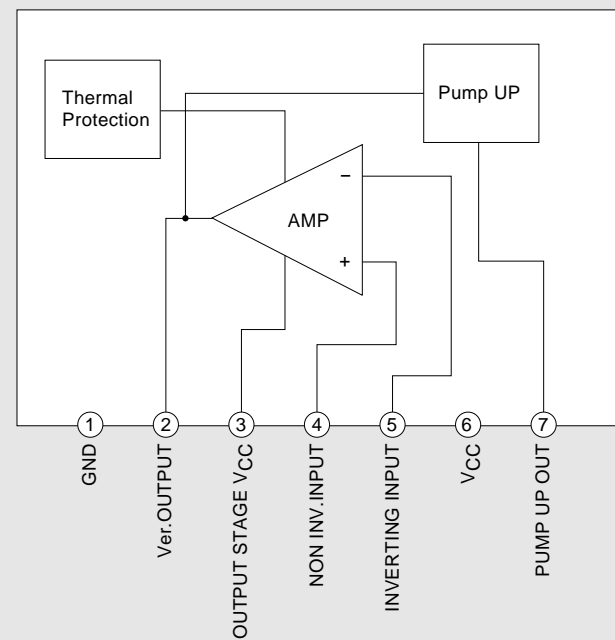
The LA78040N is a vertical deflection output IC for high-definition TV and CRT displays in systems that use a bus control system signal-processing IC. This IC can directly drive (including the DC component) the deflection yoke from the sawtooth wave output from the bus control system signal-processing IC. The color TV vertical deflection system adjustment function can be controlled from the bus system when this IC is used in conjunction with a SANYO LA768X or LA769XX series TV bus control system signal-processing IC.

The LA78040N provides a maximum deflection current of 1.7 A p-p, and thus is optimal for small to medium diameter CRTs.

Functions

- Low power operation achieved by using integrated charge pump circuit
- Vertical output circuit
- Thermal protection circuit
- Excellent crossover characteristics
- Supports DC coupling
- Package: TO220-7H

Block Diagram



Vertical Output IC

LA78041

Overview

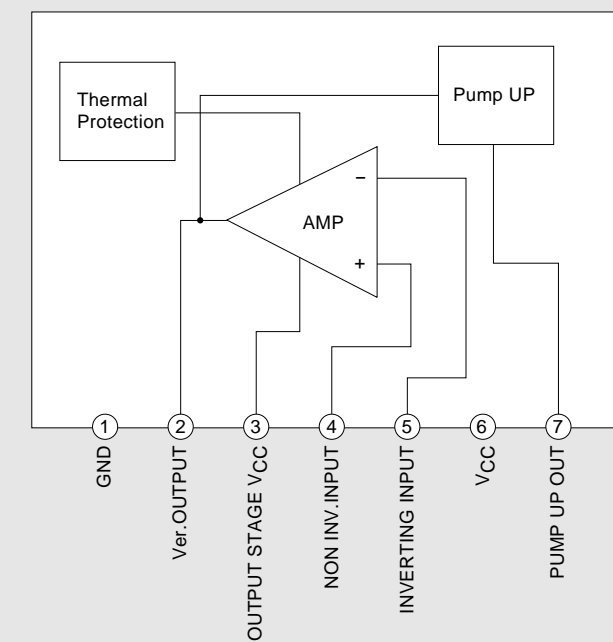
The LA78041 is a vertical deflection output IC for high-definition TV and CRT displays in systems that use a bus control system signal-processing IC. This IC can directly drive (including the DC component) the deflection yoke from the sawtooth wave output from the bus control system signal-processing IC. The color TV vertical deflection system adjustment function can be controlled from the bus system when this IC is used in conjunction with a SANYO LA768X or LA769XX series TV bus control system signal-processing IC.

The LA78041 provides a maximum deflection current of 2.2 A p-p, and thus is optimal for large diameter CRTs.

Functions

- Low power operation achieved by using integrated charge pump circuit
- Vertical output circuit
- Thermal protection circuit
- Excellent crossover characteristics
- Supports DC coupling
- Package: TO220-7H

Block Diagram



Vertical Output IC

LA78045

Overview

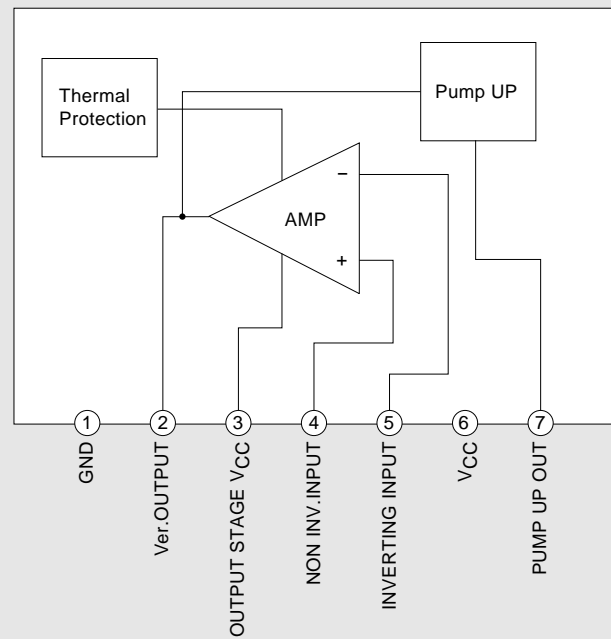
The LA78045 is a vertical deflection output IC for high-definition TV and CRT displays in systems that use a bus control system signal-processing IC. This IC can directly drive (including the DC component) the deflection yoke from the sawtooth wave output from the bus control system signal-processing IC. The color TV vertical deflection system adjustment function can be controlled from the bus system when this IC is used in conjunction with a SANYO LA768X or LA769XX series TV bus control system signal-processing IC.

The LA78045 provides a maximum deflection current of 2.2 A p-p, and thus is optimal for large diameter CRTs, and can drive the CRTs used in TV sets in the 33 to 37 inch range.

Functions

- Low power operation achieved by using integrated charge pump circuit
- Vertical output circuit
- Thermal protection circuit
- Excellent crossover characteristics
- Supports DC coupling
- Package: TO220-7H

Block Diagram



Vertical Output ICs

LA7875N/76N

Overview

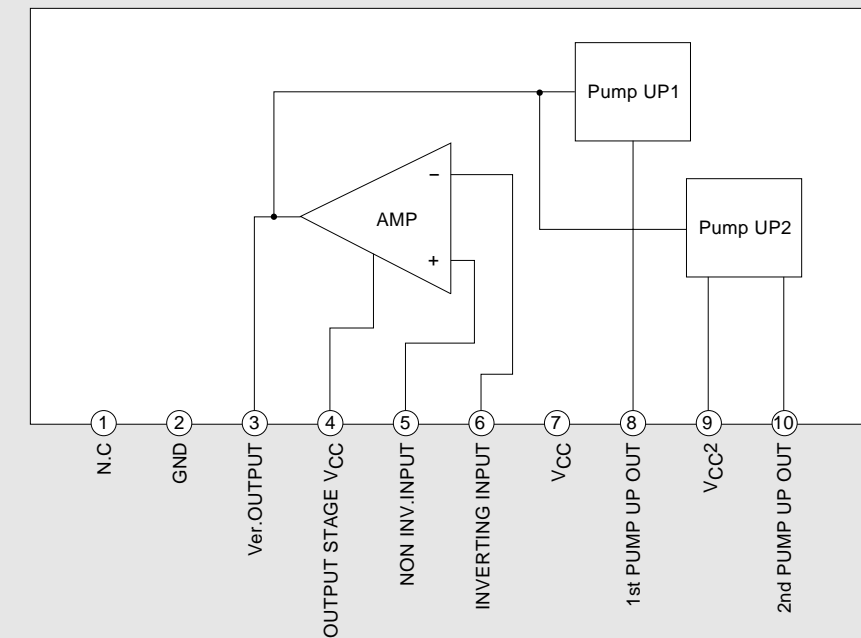
The LA7875N and LA7876N were developed for Internet TVs and high-definition TVs that require a narrow vertical retrace period. In these products, SANYO succeeded in achieving a narrow vertical retrace period by adopting a new 3_ step-up charge pump circuit. Since this allows the supply voltage to be lowered relative to the earlier 2_ step-up ICs, it achieves significantly lower power in end product designs.

Furthermore, since this IC can directly drive (including the DC component) the deflection yoke from the sawtooth wave output from the bus control system signal-processing IC, the shift operation required by wide-screen TV sets can be controlled over the bus control system. The LA7875N provides a maximum deflection current of 2.2 A p-p, and thus is optimal for medium diameter CRTs, and the LA7876N provides a maximum deflection current of 3.0 A p-p, and thus is optimal for large diameter CRTs.

Functions

- 3 × voltage step up charge pump circuit
- Low power operation
- Operational amplifier type vertical output circuit
- Supports DC direct coupling deflection yoke drive
- Excellent crossover characteristics
- Packages: LA7875N: SIP10HD
LA7876N: SIP10H

Block Diagram



Vertical Output ICs

LA7847/48

Overview

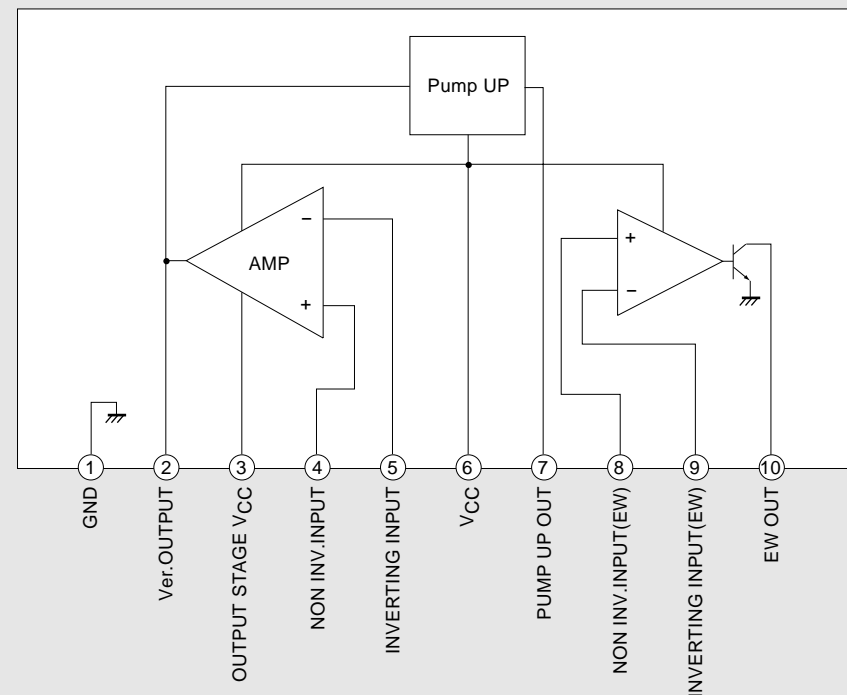
The LA7847 and LA7848 are EW drive and vertical deflection output ICs for high-definition TV and CRT displays in systems that use a bus control system signal-processing IC. These ICs can directly drive (including DC component) the deflection yoke from the sawtooth wave output from the bus control system signal-processing IC. Similarly, the diode modulator block can be driven from the parabolic wave output.

The color TV vertical deflection system and EW adjustment functions can be controlled from the bus system when either of these ICs is used in conjunction with a Sanyo LA768X or LA769XX series TV bus control system signal-processing IC. The LA7847 provides a maximum output block voltage of 72 V, a maximum deflection current of 2.2 A p-p, and an EW drive current of 0.4 A, and thus is optimal for large diameter CRTs. The LA7848 provides a maximum output block voltage of 92 V, a maximum deflection current of 2.2 A p-p, and an EW drive current of 0.4 A, and thus is optimal for large diameter CRTs.

Functions

- Built-in charge pump circuit for low power operation
- Vertical output circuit
- Excellent crossover characteristics
- Supports DC coupling
- EW drive circuit
- Package: SIP10HD

Block Diagram



Vertical Output IC

LA7849

New product

Overview

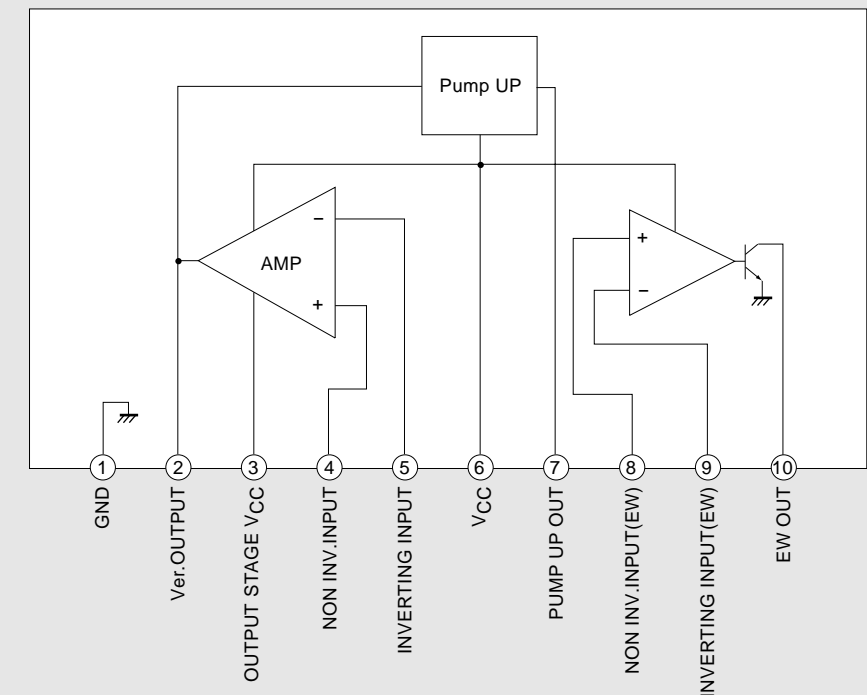
The LA7849 is an EW drive and vertical deflection output IC for high-definition TV and CRT displays in systems that use a bus control system signal-processing IC. This IC can directly drive (including the DC component) the deflection yoke from the sawtooth wave output from the bus control system signal-processing IC. Similarly, the diode modulator block can be driven from the parabolic wave output. The color TV vertical deflection system and EW adjustment functions can be controlled from the bus system when this IC is used in conjunction with a Sanyo LA768X or LA769XX series TV bus control system signal-processing IC.

The LA7849 provides a maximum output block voltage of 92 V, a maximum deflection current of 2.2 A p-p, and an EW drive current of 0.4 A, is provided in an SIP10H package, and thus is optimal for large diameter CRTs.

Functions

- Built-in charge pump circuit for low power operation
- Vertical output circuit
- Excellent crossover characteristics
- Supports DC coupling
- EW drive circuit
- Package: SIP10H

Block Diagram



LC863 Series

Flash E²PROM Microcontroller Series

Overview

The LC863 Series products are high functionality high-speed 8-bit CMOS single-chip microcontrollers that provide OSD functionality. Since SANYO provides a full series of flash ROM versions instead of the earlier erasable EPROM and one-time programmable PROM versions, this series can easily respond to needs for rapid specification changes during mass production ramp up and for specification changes by target application. In addition to the large-capacity display RAM, the LC863 Series products provide a high-performance OSD function that features increased CGROM capacity and supports simple graphics functions.

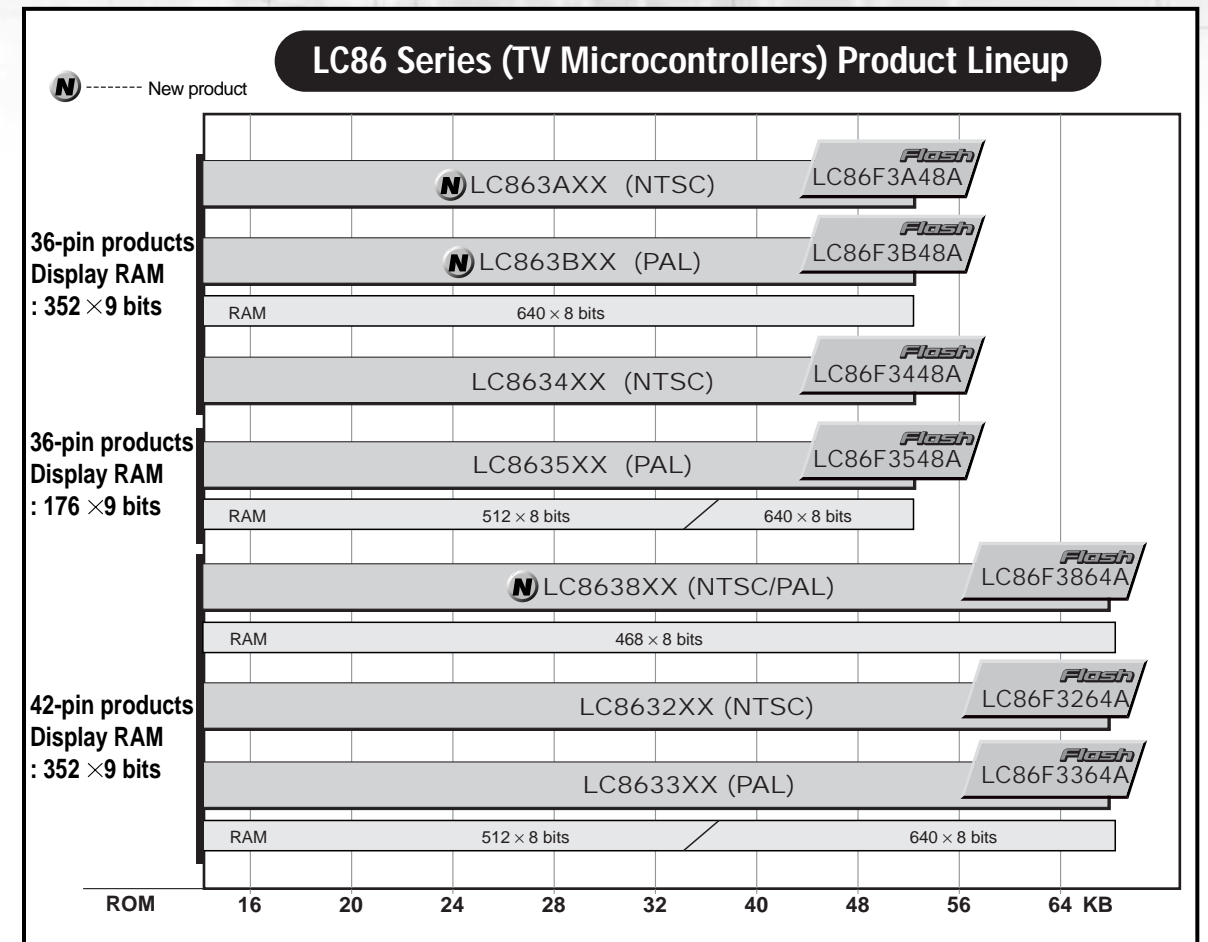
Since the LC8638XX, LC8632XX (DIP42, QFP48), LC863AXX, and LC8634XX (DIP36, SOP36) provide a built-in caption data slicer circuit, they can implement, in a single chip, end products that provide caption, XDS (Extended Data Service), and Vchip functions. Although the LC8633XX, LC8635XX, and LC863BXX do not include the built-in caption data slicer circuit, they are essentially pin and function compatible with the LC8632XX, LC8634XX, and LC863AXX. This allows creation of a unified chassis for NTSC and PAL format products.

Since these series products are available in not only a DIP package, but in a flat package as well, they can contribute to end product chassis miniaturization.

Functions

- ROM: 16 to 64K bytes
(The 36-pin versions have a maximum of 48K bytes.)
- CGROM: 16K bytes
- RAM: 512 to 768 bytes
- Display RAM: 352 × 9 bits
(The LC8635XX models have 176 × 9 bits.)
- 16-bit timer/counter circuit
- PWM generator/16-bit timer circuit
- Clock time base timer
- Watchdog timer (Uses an external RC circuit)
- 8-bit synchronous serial interface (in 42-pin versions)
- Multi-master I²C bus serial interface
- Remote control receiver circuit
- Three 7-bit PWM output circuits
- Four-channel 8-bit A/D converter
(The 36-pin versions have a 6-bit converter.)
- I/O ports: Up to 29 pins
- Powerful interrupt function
 - 16 interrupt sources with 10 vector locations (LC8632XX)
 - Multiple interrupts supported using three interrupt levels
- Standby function (halt and hold modes)
- High-speed operation
 - Minimum cycle time: 0.848 μs (bus cycle: 0.424 μs)
- Powerful highly symmetric instruction set shared with the LC86 Series.
 - Number of instructions: 68
- OSD function
 - 36 characters × 8 lines (The LC8635XX models only support 4 lines.)
 - Number of 16 × 32 dot characters: 252 characters
(The number of characters can be expanded by using some characters as divided characters.)
 - Display colors: 16 colors
 - Simple graphics function
Cells consisting of 16 × 16 dots can be formed from 4 colors.
 - Extensive set of control functions that operate on a line basis
 1. Vertical and horizontal position
 2. Character size: Ten character sizes, including 1.5 × in the horizontal direction, and 0.5 × in the horizontal and vertical directions.
 3. Character pitch
 4. Display start or end line (shutter function)
- Data slicer function (LC8632XX, LC8634XX, and LC863AXX)
 - Extracts closed caption and XDS data
 - NTSC or PAL selectable and line can be specified
 - ROM correction function

These flash memory products are manufactured and sold by SANYO Electric Co., Ltd. under license from Silicon Storage Technologies, Inc. (SST).



LC86F3448A TV Flash Microcontroller

High functionality OSD Characters in font: 252 (maximum) 36 character × 8 lines (maximum) Simple graphics functions Shutter function Scrolling function And other functions	Data slicer (Variable Line) XDS (Extended Data Service) Vchip functions	RAM: 640 bytes + Display RAM: 352 × 9 bits
	DIP36S (400mil) MFP36SD (375mil)	Three 7-bit PWM channels
Multi-master support I²C bus serial interface	Four-channel 6-bit A/D converter	64 KB flash memory 48 KB (program area) 16 KB (character font area)
ROM correction function	16-bit timer/counter	Onboard programming

TV Control Microcontrollers

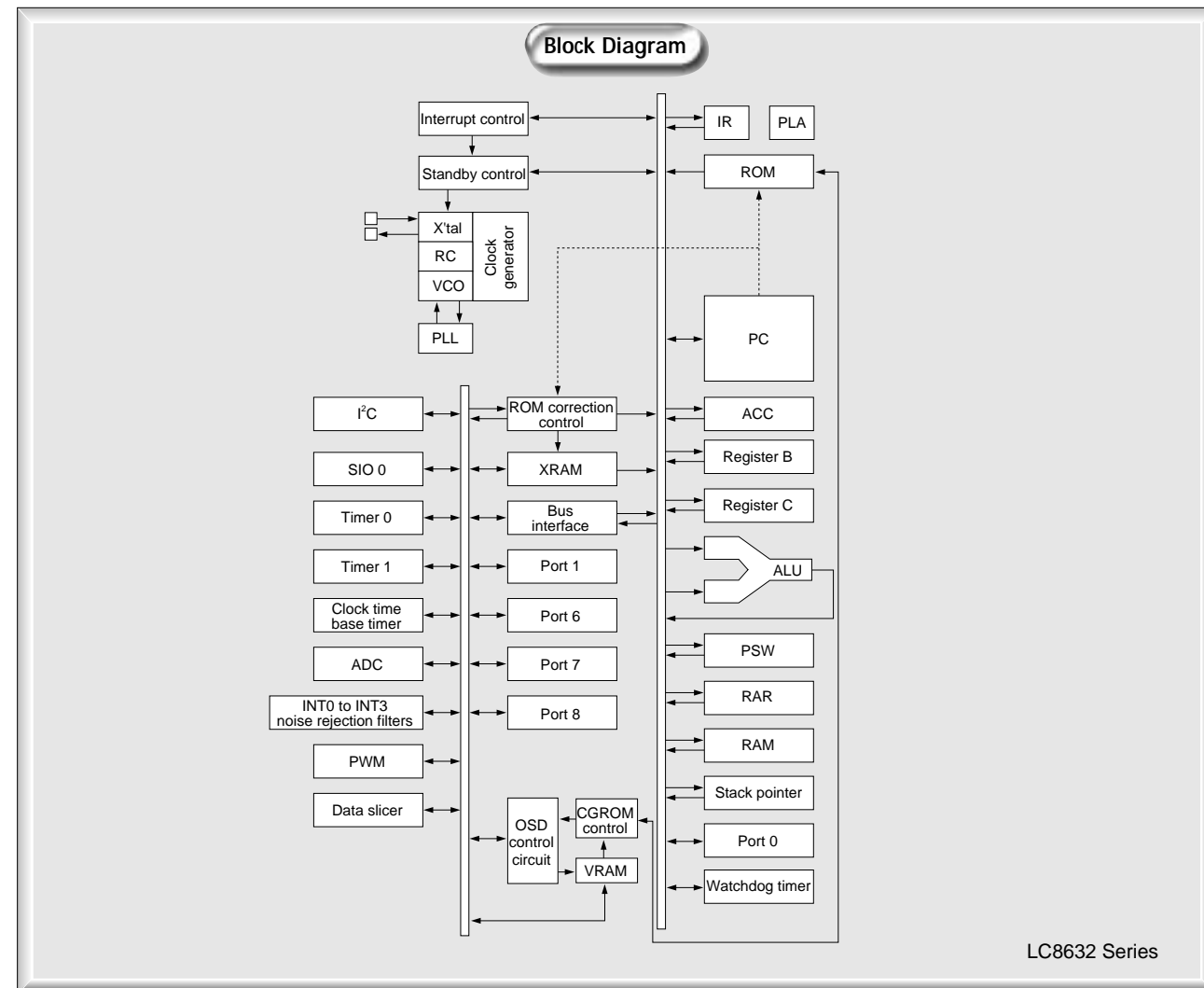
LC8632/34/38/3A Series (NTSC)

Overview

The LC8632/LC8634/LC8638/LC863A Series are closed caption TV control 8-bit microcontrollers that integrate an extensive set of peripheral functions around a CPU core that operates with a minimum cycle time of 0.424 μ s. The peripheral functions include 16 to 64 KB of program ROM, 16 KB of CGROM, 384 to 640 bytes of RAM, 352 \times 9 bits of CRT display RAM, as well as 16-bit timer/counter, PWM, A/D converter, I²C bus compatible serial interface, closed caption data slicer, and closed caption OSD circuits. These microcontrollers can implement TV control and closed caption display in a single chip.

Functions

- OSD function
 - Screen display: 36 characters \times 16 lines (supported in software)
 - Number of characters: 252 characters in a 16 \times 32 dot font (Of these, 4 characters including one test character are fixed.)
 - Simple graphics function (A font in which a single character is 16 \times 16 dots and can be painted with 4 colors)
- I²C bus multi-master serial interface: One built-in circuit with two sets of pins
- Flash memory versions are available for each series and allow onboard programming



TV Control Microcontrollers

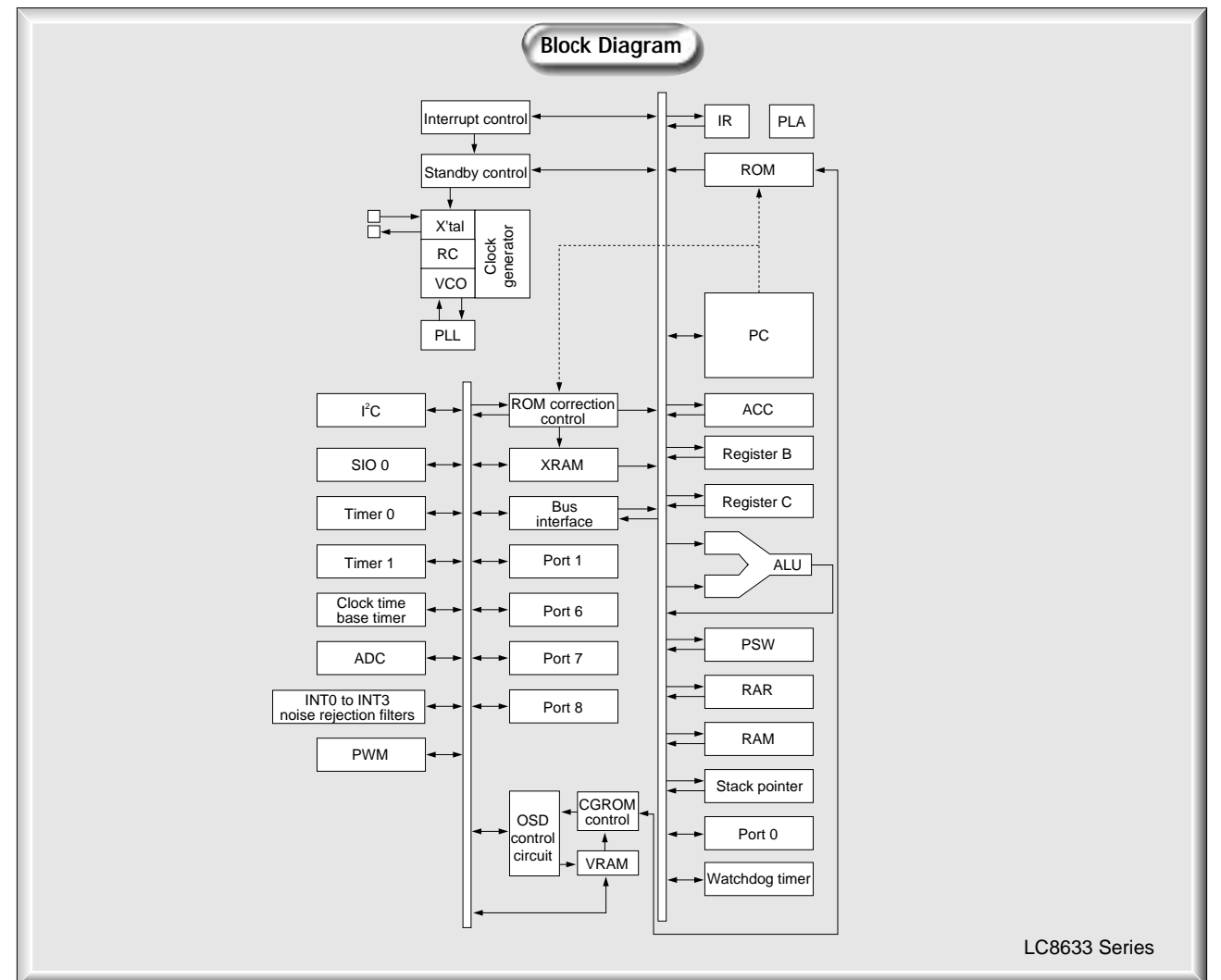
LC8633/35/3BXX Series (PAL)

Overview

The LC8633/LC8635/LC863BXX Series are TV control 8-bit microcontrollers that integrate an extensive set of peripheral functions around a CPU core that operates with a minimum cycle time of 0.424 μ s. The peripheral functions include 16 to 64 KB of program ROM, 16 KB of CGROM, 384 or 512 bytes of RAM, 176 or 352 \times 9 bits of CRT display RAM, and two 16-bit timer/counter circuits, as well as PWM, A/D converter, I²C bus compatible serial interface, and OSD circuits. These microcontrollers can implement TV control in a single chip.

Functions

- OSD function
 - Screen display: 36 characters \times 8 lines (supported in software)
 - Number of characters: 252 characters in a 16 \times 32 dot font (Of these, 4 characters including one test character are fixed.)
 - Simple graphics function (A font in which a single character is 16 \times 16 dots and can be painted with 4 colors)
- I²C bus multi-master serial interface: One built-in circuit with two sets of pins
- Flash memory versions are available for each series and allow onboard programming



VHS Format VCR System Chip Set

The world of SANYO Multimedia System Chip Sets

At the same time as providing high quality and high reliability with adjustment-free ICs, SANYO is striving for even further reductions in mounting area by incorporating even more peripheral components in the IC itself and by increasing integration densities.

High quality and high reliability assured by adjustment-free technology

Partially adjustment-free, high functionality

- LA7567BM/BVA (N) P 47
- LA75676VA (N) P 48
- LA75665NM/NV (N) P 49

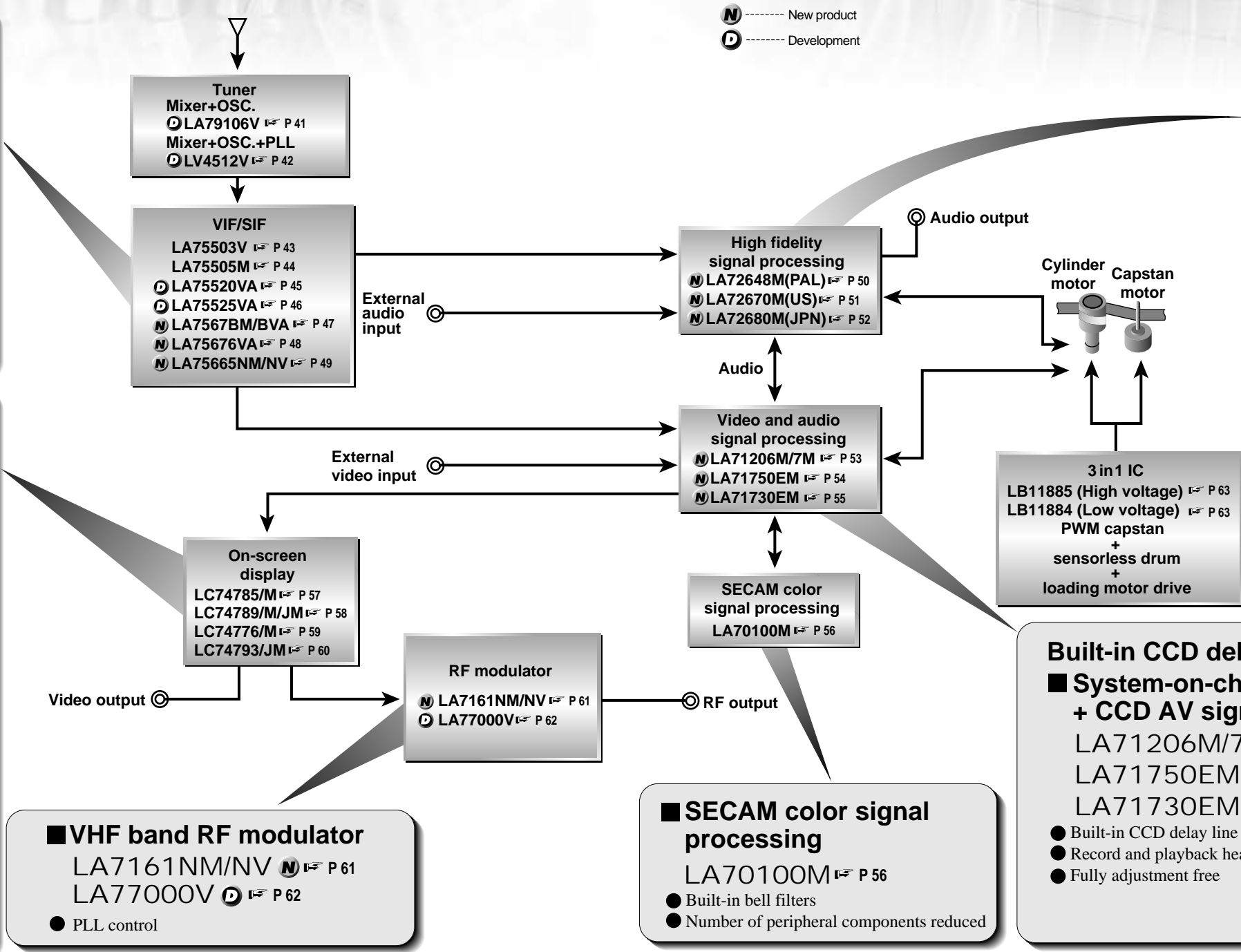
Fully adjustment-free operation achieved

- LA75503V P 43
- LA75505M P 44
- LA75520VA (D) P 45
- LA75525VA (D) P 46

- PAL multiformat: LA75503V, LA75520VA
- NTSC: LA75505M, LA75525VA

Built-in sync separator and EDS circuits

- Built-in sync separator circuit OSD function with EDS function LC74785/M P 57
- Built-in EDS
- Built-in sync separator circuit OSD LC74789/M/JM P 58
- Support for the NTSC, PAL, PAL-N, PAL-M, NTSC 4.43, and PAL60 formats
- Sync separator circuit
- 12×18 dot font
- Built-in sync separator circuit OSD function with VPS/PDC functions LC74776/M P 59
- Built-in VPS and PDC
- VPS/PDC IC LC74793/JM P 60
- I²C bus support



(N) ----- New product
 (D) ----- Development

Low-Power Design

- High fidelity signal processing with built-in canal switch. LA72648M (N) P 50
- Built-in high-fidelity head amplifier
- Number of peripheral components reduced
- Input capacitors eliminated
- Built-in canal switch
- High fidelity signal processing with built-in SIF and audio demultiplexer LA72670M(US) (N) P 51
 LA72680M(JPN) (N) P 52
- Built-in high-fidelity head amplifier
- Audio demultiplexer

Built-in CCD delay line and Head Amplifier

- System-on-chip H.A, YCA, Canal switch + CCD AV signal-processing IC
 LA71206M/7M(NTSC) (N) P 53
 LA71750EM(PAL) (N) P 54
 LA71730EM(Multi) (N) P 55
- Built-in CCD delay line
- Record and playback head amplifiers
- Fully adjustment free
- All filters built in
- PAL/SECAM discrimination circuit : LA71750EM/71730EM
- Canal switch : LA71750EM/71730EM

VHF band RF modulator
 LA7161NM/NV (N) P 61
 LA77000V (D) P 62

- PLL control

SECAM color signal processing
 LA70100M P 56

- Built-in bell filters
- Number of peripheral components reduced

Extensive Lineup Provides Full System Support

Power Supply Systems

- Low saturation voltage power supplies: L88MSOOT series
- On/off function
- Multifunction power supplies: LA56XX series
- Satellite broadcast tuner power supplies: LA5606N/LA5607N

Power Supply System Peripheral Transistors

- High breakdown voltage MOSFET series
- Ultralow on-resistance MOSFET series
- Ultraminiature light weight PicoMOS™ series
- Ultralow saturation voltage MBIT-II transistor series
- Low Vf Schottky barrier diode series
- PicoTR series

VHF/UHF Tuner Transistors

- High-frequency MOSFET series
- High-frequency transistor series (fT = 1 to 6 GHz)
- PicoGET series
- 15GNO1M, 55GNO1M

VCR Microcontrollers: LC870200 Series

- Software and servo functions
- Built-in control amplifier
- VPS, PDC, and XDS data slicer
- OSD
- Flash version: LC87F02C8A

Tuner IC

LA79106V

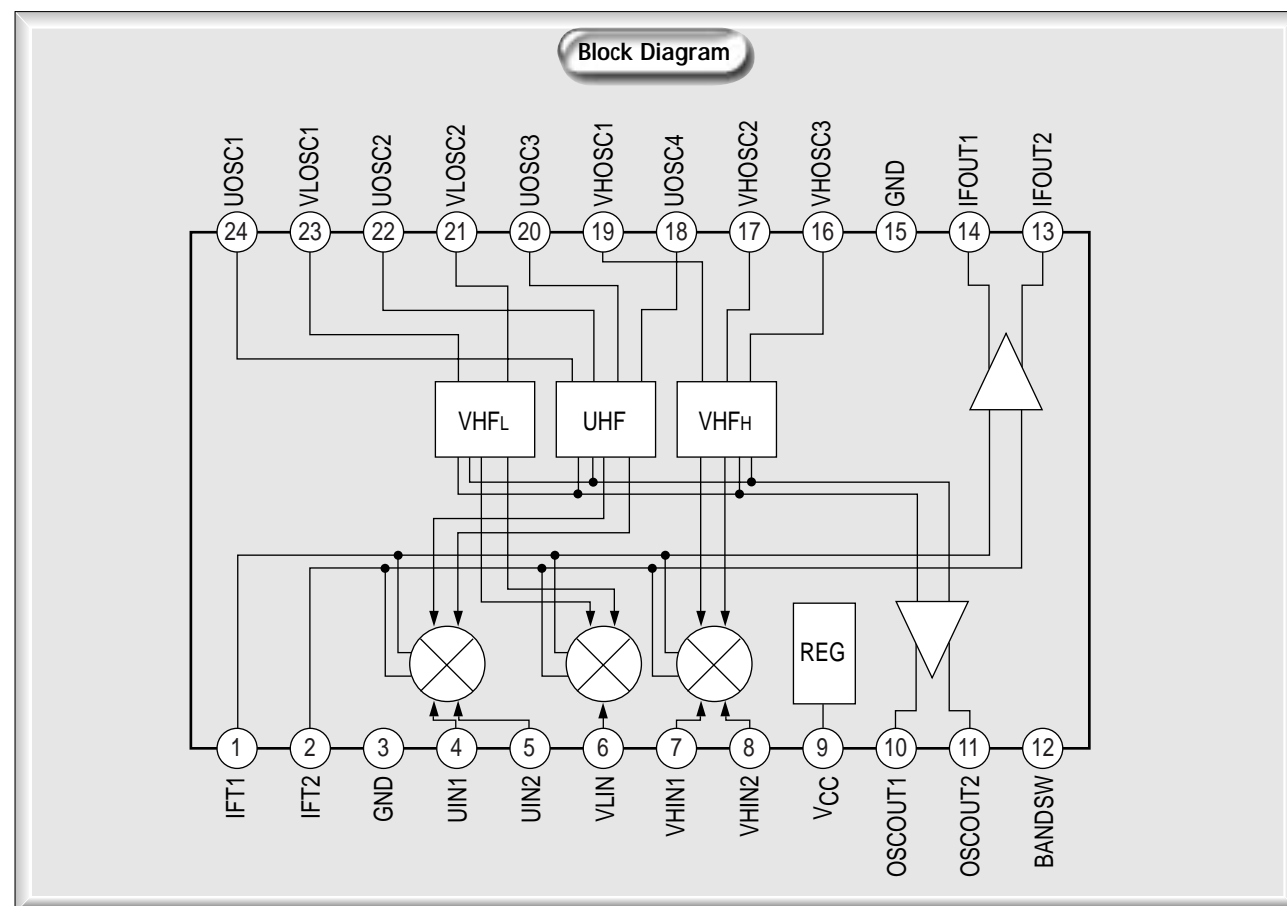
Development

Overview

The LA79106V is a voltage synthesized tuner IC that integrates mixers for three bands (VHF (low), VHF (high), and UHF) and an oscillator circuit on a single chip.

Functions

- Double balanced mixer (base input): VHF (low)
- Double balanced mixers (emitter input): VHF (high) and UHF
- Lo output pin
- Built-in mixer and oscillator regulator
- Supply voltage: $V_{CC} = 5\text{ V}$
- Package: SSOP24 (275 mil)



Tuner IC

LV4512V

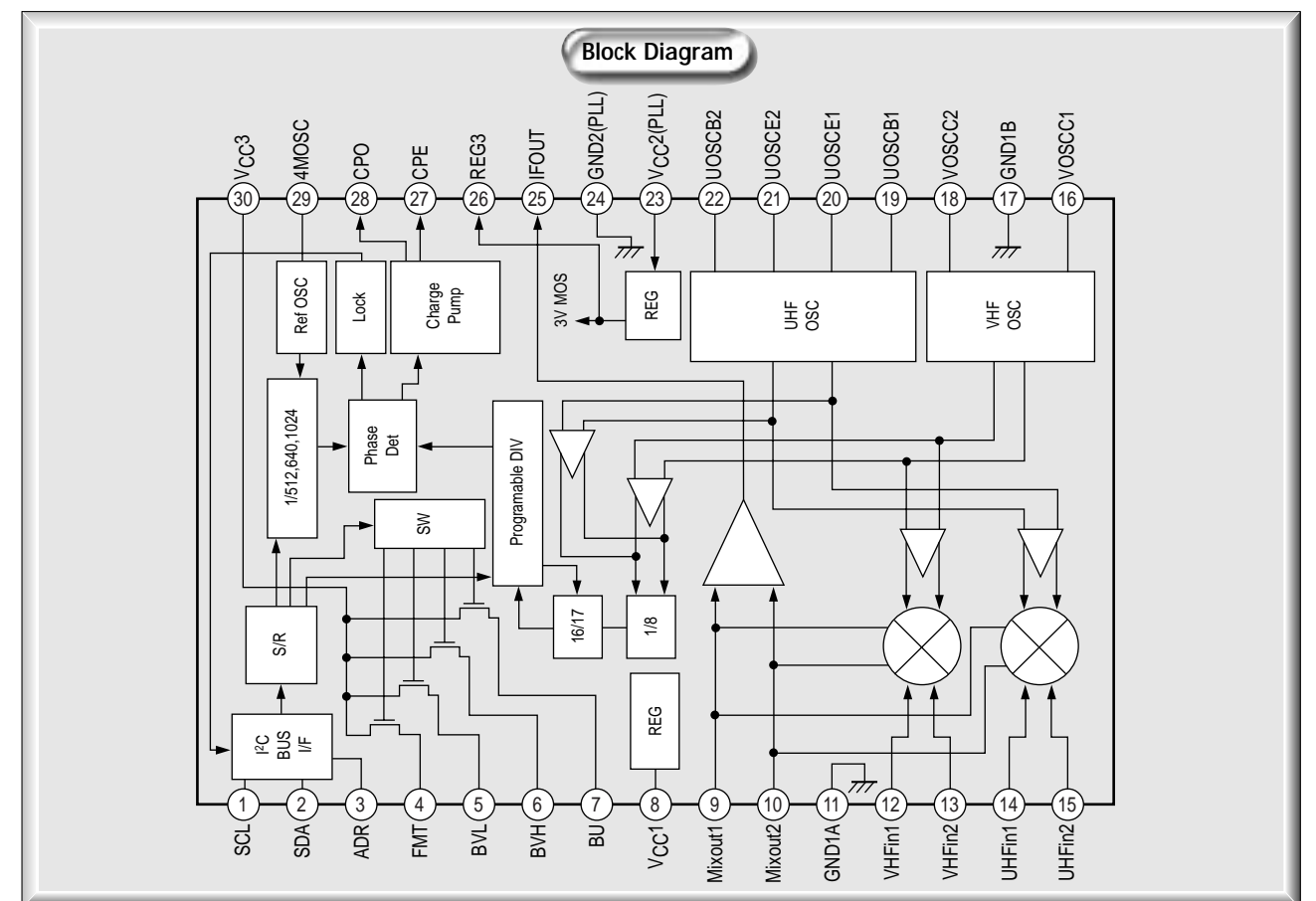
Development

Overview

The LV4512V integrates local oscillator circuits for the VHF and UHF bands, mixers, an IF amplifier, and a PLL circuit for tuning on a single chip. It is controlled using an I²C bus.

Functions

- PLL circuit for tuning
- I²C bus control
- Frequency steps (31.25, 50, and 62.5 kHz when a reference frequency of 4 MHz is used)
- Four on-chip Banol switches
- Can be controlled at any one of four I²C bus addresses
- Supply voltage: $V_{CC} = 5\text{ V}$
- Package: SSOP30 (275mil)



VIF/SIF Signal-Processing Circuit

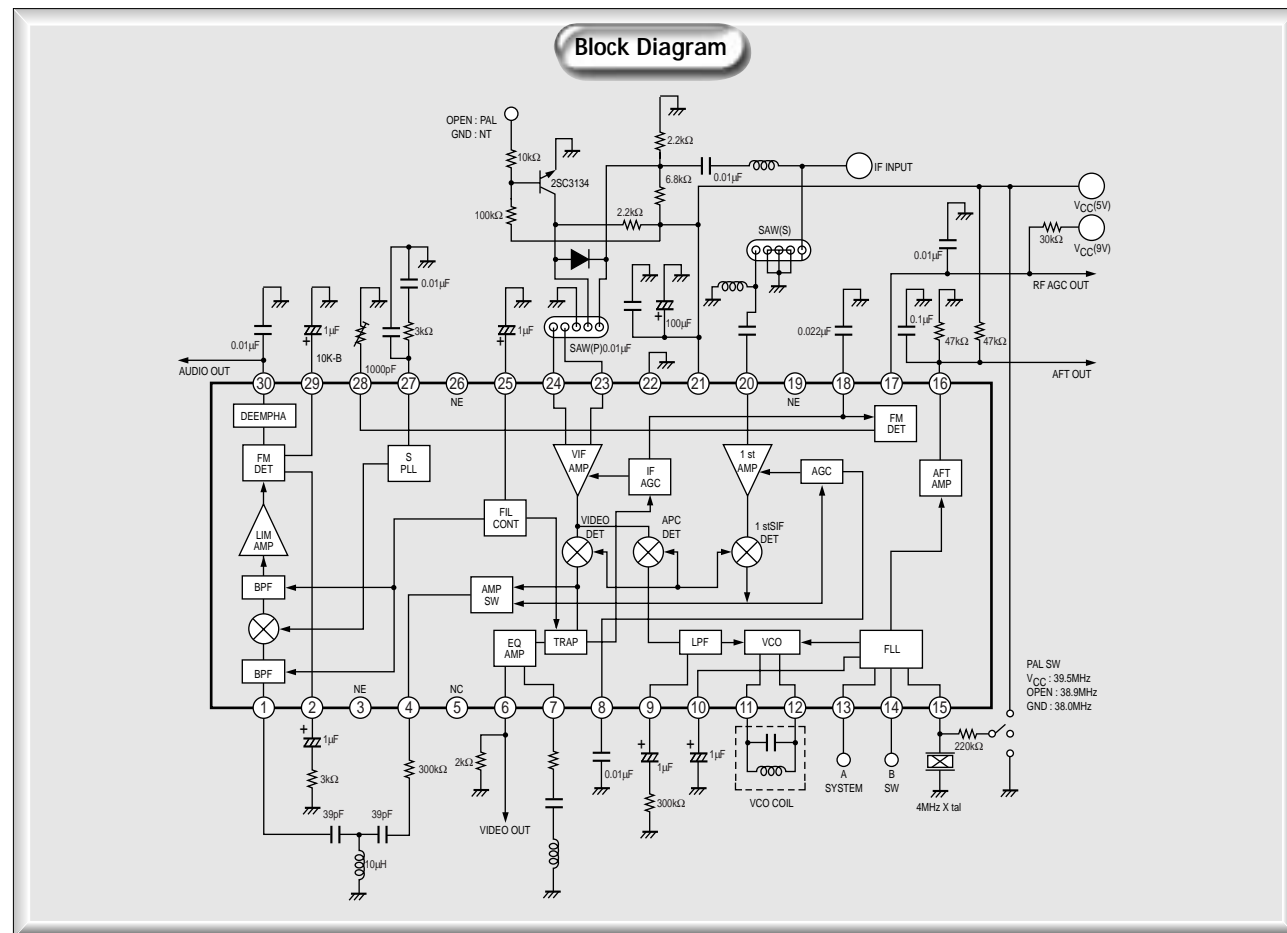
LA75503V

Overview

The LA75503V is a completely adjustment-free PAL VIF/SIF signal-processing IC for TV sets and VCRs. It supports IF frequencies of 38, 38.9, and 39.5 MHz. It also provides on-chip audio carrier trap, and audio carrier bandpass filters to support PAL multisystem audio (M/N, B/G, I, and D/K). A reference frequency of 4 MHz is used for the adjustment-free circuits, and the VCO, AFT, and audio filters are controlled either by a crystal oscillator circuit or an external clock input.

Functions and Features

- VIF amplifier
- VCO adjustment-free PLL detection circuit
- Digital AFT circuit
- RF AGC
- Buzz canceller
- Equalizer amplifier
- Audio carrier bandpass filter
- Audio carrier trap
- PLL FM detector
- Reference signal generator
- The built-in VCO has been made adjustment free so that VCO coil adjustment is not required.
- The integration on the same chip of the audio bandpass filter and trap make implementation of end products that support PAL multisystem audio easy and low cost.
- Achieves a significant reduction in the number of required peripheral components
- Obviates the problem of AFT tolerances by adopting a digital AFT system
- Package: SSOP30 (275 mil)



VIF/SIF Signal-Processing Circuit

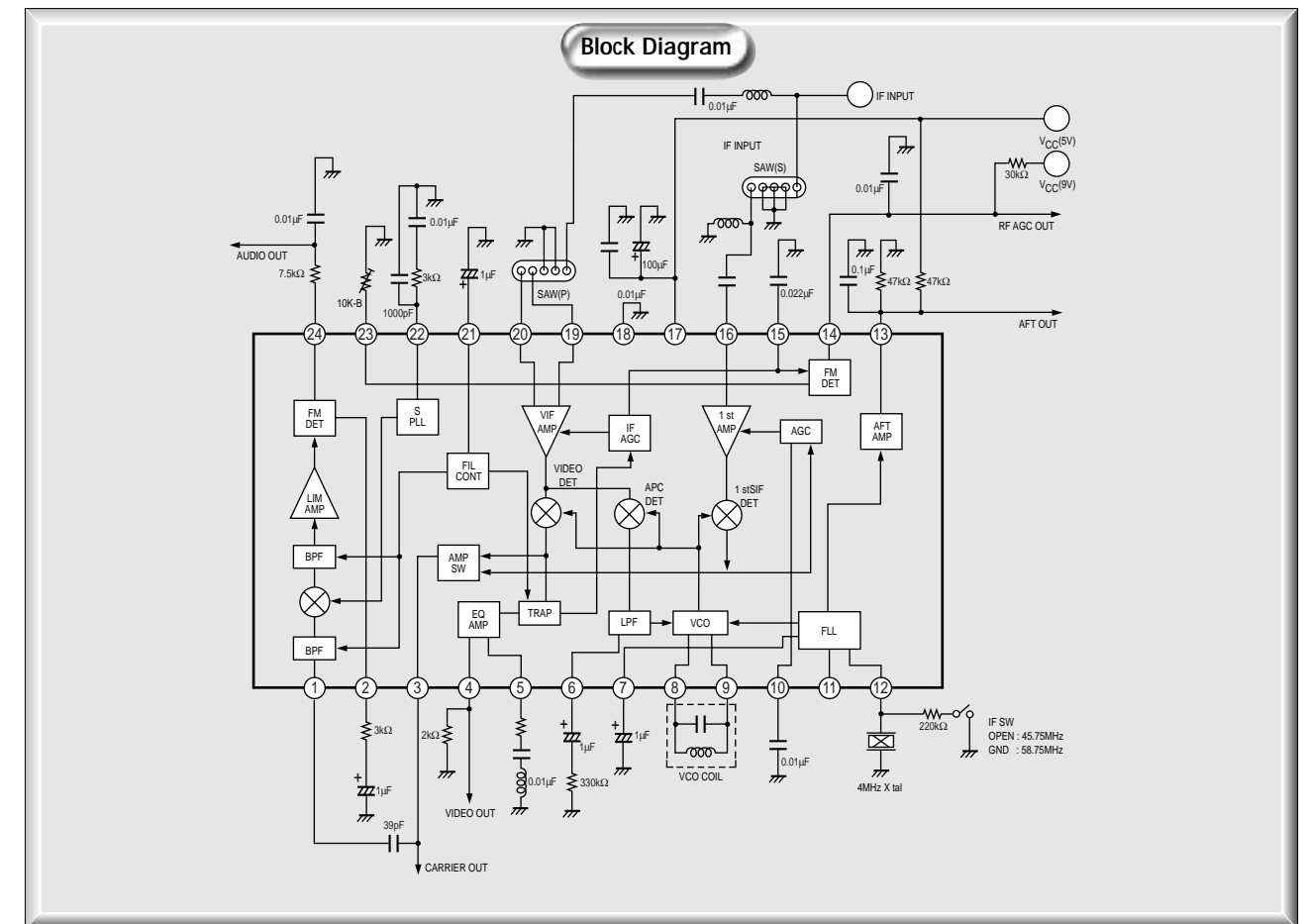
LA75505M

Overview

The LA75505M is a completely adjustment-free NTSC VIF/SIF signal-processing IC for TV sets and VCRs. It supports IF frequencies of 45.75 and 58.75 MHz. It integrates both audio carrier trap and audio carrier bandpass filters on chip and thus is optimal for compact light weight tuners. A reference frequency of 4 MHz is used for the adjustment-free circuits, and the VCO, AFT, and audio filters are controlled either by a crystal oscillator circuit or an external clock input.

Functions and Features

- VIF amplifier
- VCO adjustment-free PLL detection circuit
- Digital AFT circuit
- RF AGC
- Buzz canceller
- Equalizer amplifier
- Audio carrier bandpass filter
- Audio carrier trap
- PLL FM detector
- Reference signal generator
- The built-in VCO has been made adjustment free so that VCO coil adjustment is not required.
- The integration on the same chip of the audio bandpass filter and trap significantly reduces the number of required peripheral components for lower total costs.
- Obviates the problem of AFT tolerances by adopting a digital AFT system
- Package: MFP24S (300mil)



VIF/SIF Signal-Processing Circuit

LA75520VA

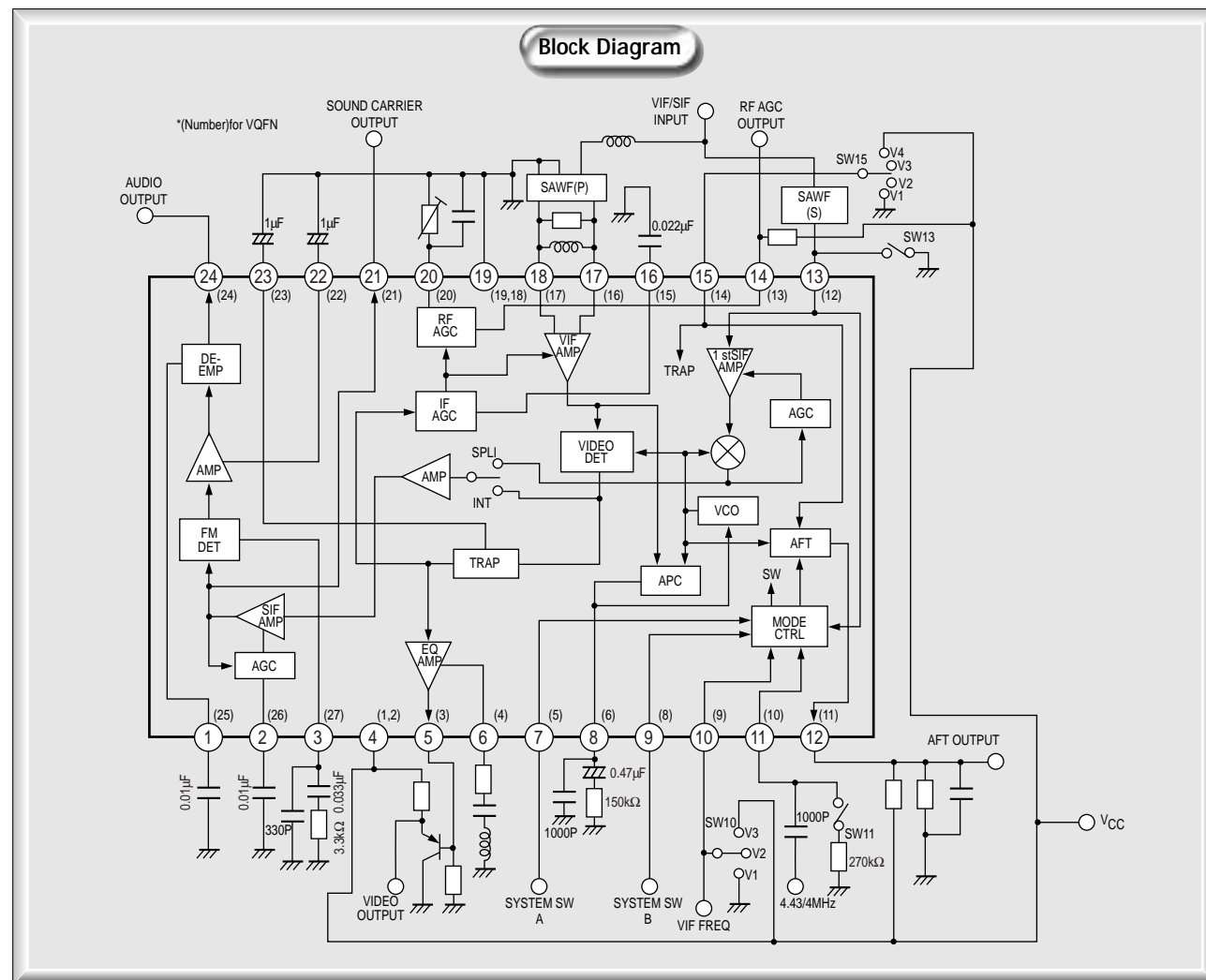
Development

Overview

The LA75520VA is a completely adjustment-free PAL VIF/SIF IC for TV sets and VCRs. It supports IF frequencies of 38, 38.9, and 39.5 MHz. It integrates an automatic adjustment circuit for the VCO, an AFT circuit, and an audio carrier trap circuit on the same chip and requires the input of either a 4 MHz or 4.43 MHz reference signal.

Functions

- Automatic adjustment VCO (no external VCO coil is required)
- Built-in audio carrier trap supports the B/G, I, D/K, and M/N audio systems
- Digital AFT adopted
- Package: SSOP24 (275mil)



VIF/SIF Signal-Processing Circuit

LA75525VA

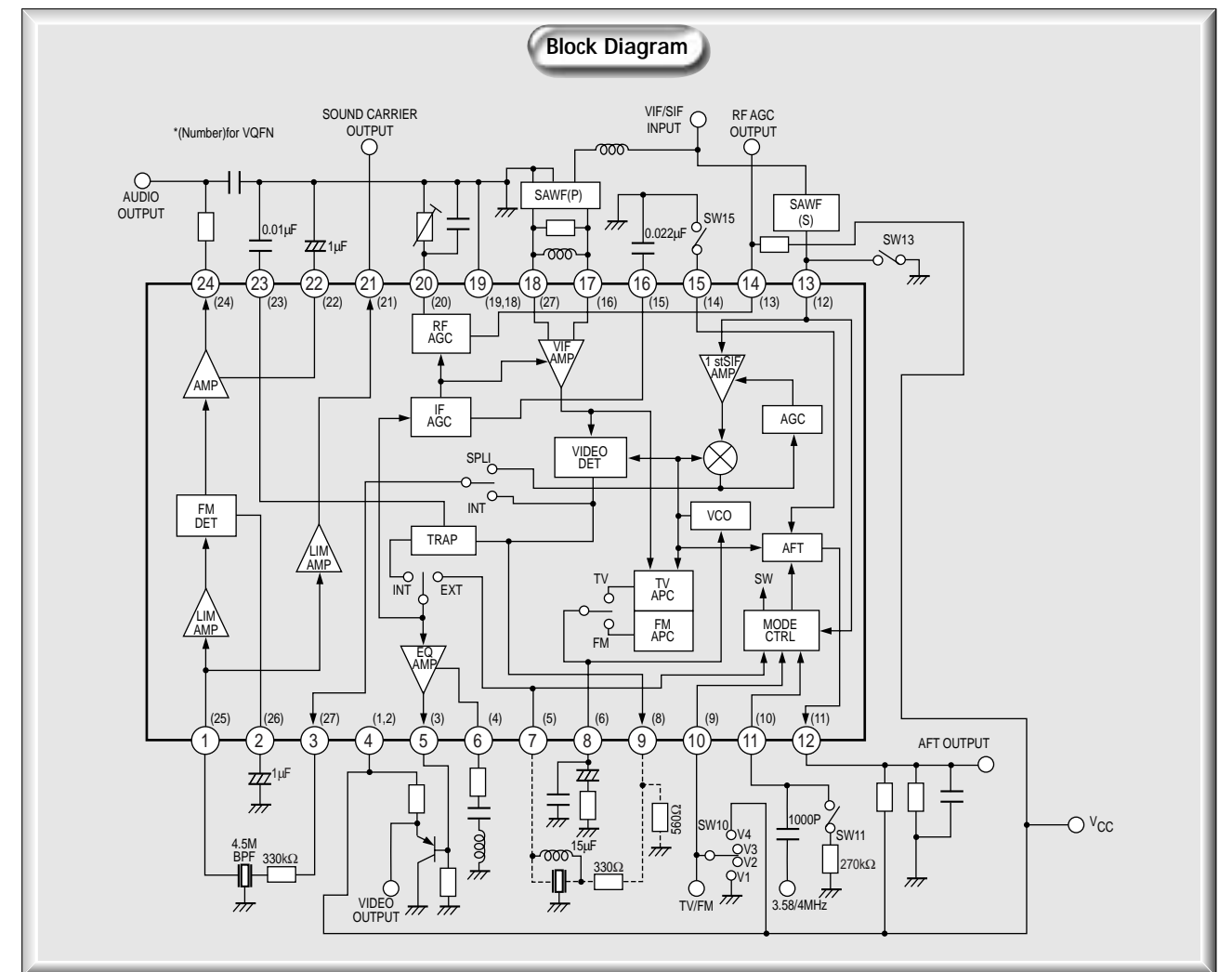
Development

Overview

The LA75525VA is a completely adjustment-free NTSC VIF/SIF IC for TV sets and VCRs. It supports IF frequencies of 45.75 and 58.75 MHz. It integrates an automatic adjustment circuit for the VCO, an AFT circuit, and an audio carrier trap circuit on the same chip and requires the input of either a 4 MHz or 3.58 MHz reference signal.

Functions

- Automatic adjustment VCO (no external VCO coil is required)
- Built-in audio carrier trap; an external circuit may be used if desired
- Digital AFT adopted
- FM radio receiver function
- Package: SSOP24 (225mil)



VIF/SIF Signal-Processing Circuit

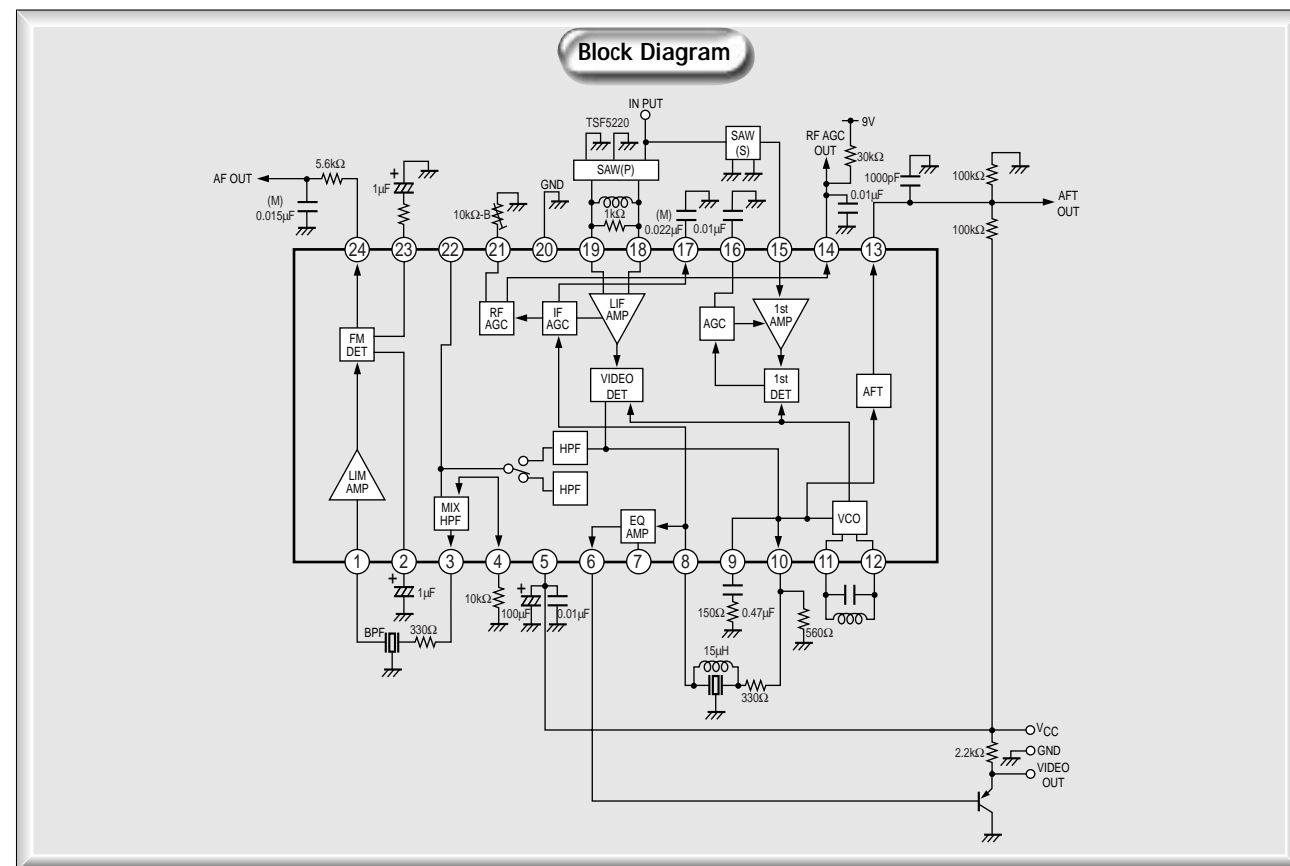
LA7567BM/BVA New product

Overview

The LA7567MB and LA7567BVA are PAL/NTSC multi-system VIF/SIF ICs that adopt a partially adjustment-free circuit structure. The LA7567BMV is provided in an SSOP24 (225 mil, 0.5 mm lead pitch) package that is optimal for miniature 2-in-1 tuners. The VIF block adopts a technique that makes AFT adjustment unnecessary by adjusting the VCO, thus simplifying the adjustment process. PLL detection is adopted for FM detection to handle audio multipath detection. These ICs include a on-chip SIF converter, making design of multi-system products easier. The supply voltage is the same 5 V used in multimedia systems. In addition, an on-chip buzz canceller suppresses Nyquist buzz for superb audio quality. These products provide improved video and audio signal-to-noise ratios and improved video signal amplitude as compared to the LA7567N/NM.

Functions and Features

- VIF amplifier
- PLL detector
- BNC
- RF AGC
- Equalizer amplifier
- AFT
- IF AGC
- Buzz canceller
- First SIF
- First SIF detector
- AGC
- Multi SFI converter
- Limiter amplifier
- PLL FM detector
- The AFT and SIF require no coils and are adjustment free
- PAL/NTSC multiformat audio systems can be implemented easily
- Built-in buzz canceller for excellent audio characteristics
- V_{CC} = 5 V, low-power operation
- Packages: LA7567BM: MFP24S (300mil)
LA7567BVA: SSOP24 (225mil)



VIF/SIF Signal-Processing Circuit

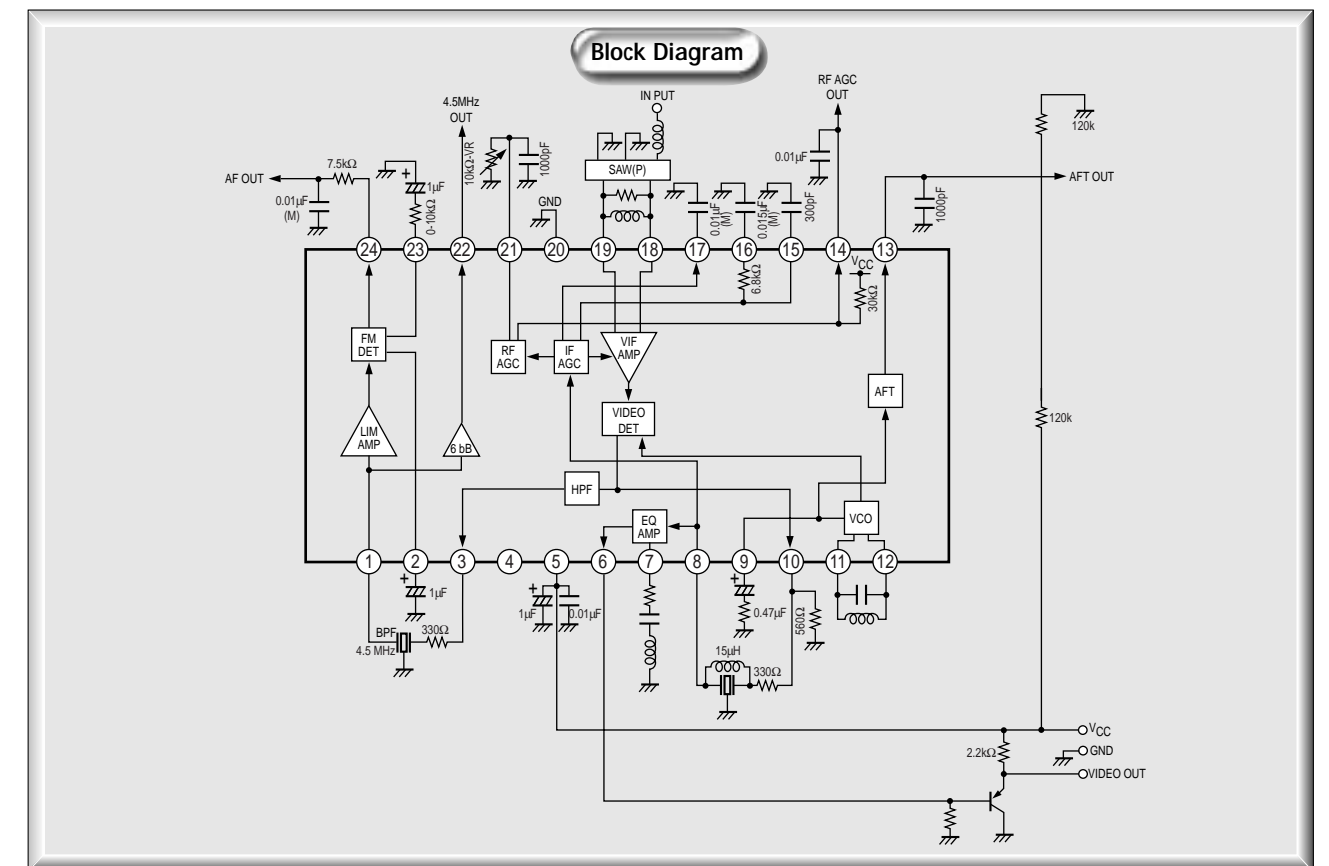
LA75676V/676VA New product

Overview

The LA7576V and LA7576VA are NTSC intercarrier VIF/SIF ICs that adopt a partially adjustment-free circuit structure. The LA7567VA is provided in a SSOP24 (225 mil, 0.5 mm lead pitch) package that is optimal for miniature 2-in-1 tuners. The VIF block adopts a technique that makes AFT adjustment unnecessary by adjusting the VCO, thus simplifying the adjustment process. PLL detection is adopted for FM detection. The supply voltage is the same 5 V used in multimedia systems. In addition, an on-chip buzz canceller suppresses Nyquist buzz for superb audio quality.

Functions and Features

- VIF amplifier
- PLL detector
- BNC
- RF AGC
- Equalizer amplifier
- AFT
- IF AGC
- Buzz canceller
- Limiter amplifier
- PLL FM detector
- The AFT and SIF require no coils and are adjustment free
- Built-in buzz canceller for excellent audio characteristics
- V_{CC} = 5 V, low-power operation
- Packages: LA7576VA: SSOP24 (225mil)
LA7576V: SSOP24 (275mil)



VIF/SIF Signal-Processing Circuit

LA75665NM/NV

New product

Overview

The LA75665NM and LA75665NV are PAL/NTSC multi-system VIF/SIF ICs that adopt a partially adjustment-free circuit structure. The VIF block adopts a technique that makes AFT adjustment unnecessary by adjusting the VCO, thus simplifying the adjustment process.

PLL detection is adopted in the SIF block to handle audio multipath detection. The SIF input block provides four input systems and an internal input selection switch. This makes it easier to design products that handle multi-sound systems. Furthermore, this switch can also be used for video system sound trap switching. In addition, an on-chip buzz canceller suppresses Nyquist buzz for superb audio quality.

Functions and Features

- The AFT and SIF require no coils and are adjustment free
- PAL/NTSC multiformat audio systems can be implemented easily
- Built-in buzz canceller for excellent audio characteristics
- Package: LA75665NM: MFP24S (300mil)
LA75665NV: SSOP24 (275mil)

[VIF Block]

- VIF amplifier
- PLL detector
- BNC
- RF AGC
- Equalizer amplifier

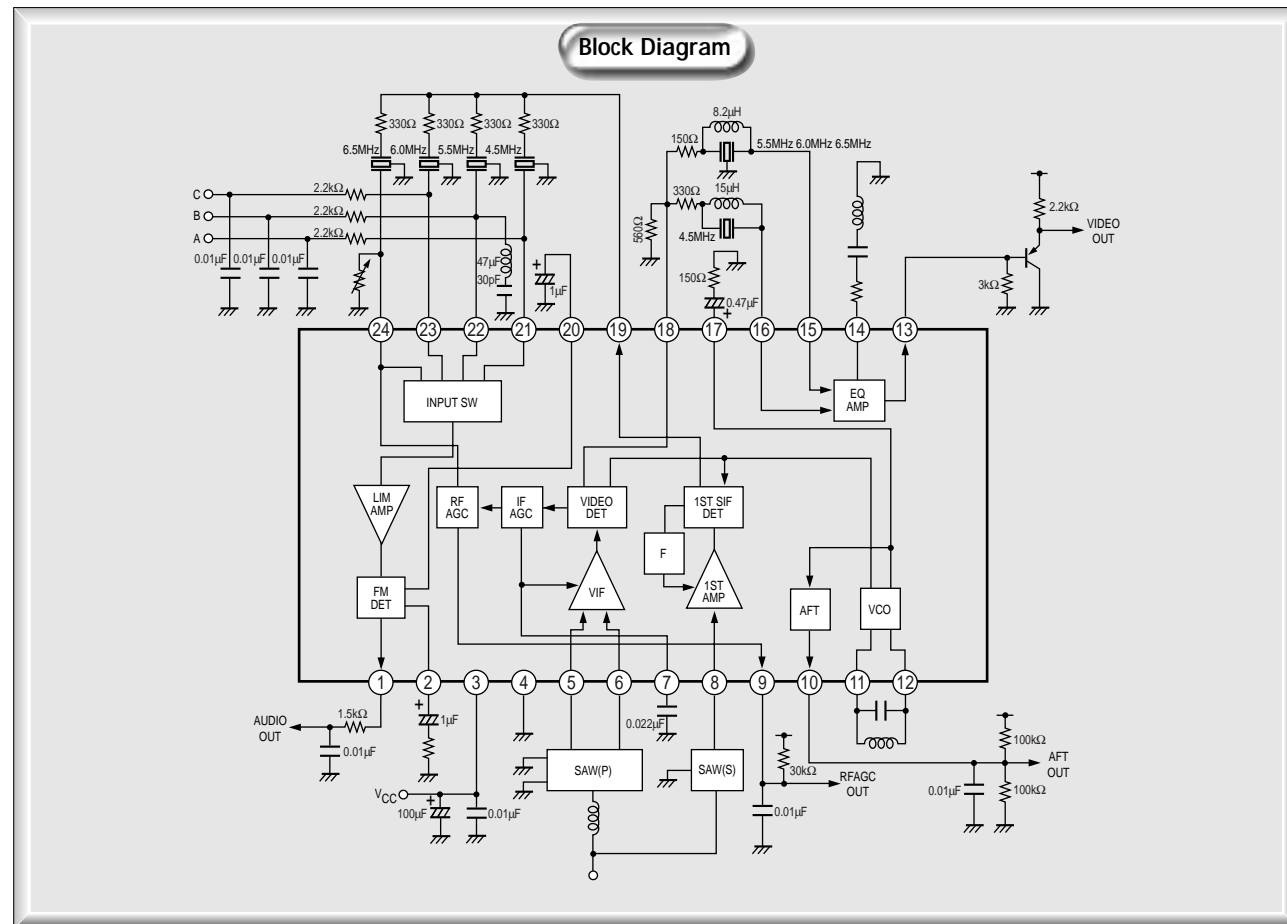
- AFT
- IF AGC
- Buzz canceller

[First SIF Block]

- First SIF amplifier
- First SIF detector
- AGC

[SIF Block]

- Multi-input selector switch
- Limiter amplifier
- PLL FM detector



PAL Hi-Fi Audio Signal Record and Playback Processing

LA72648M

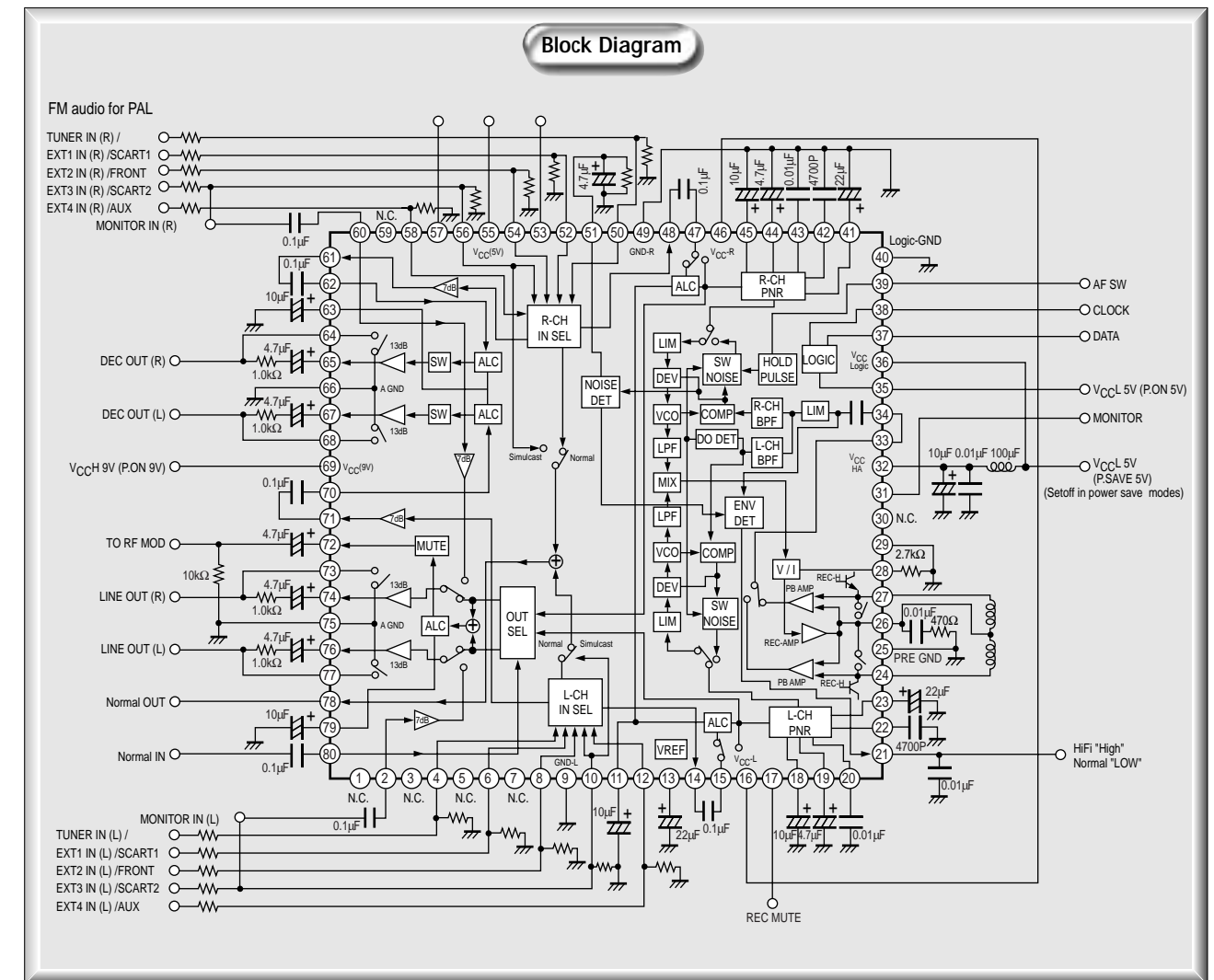
New product

Overview

The LA72648M is a PAL format system IC that adds a CANAL switch to the Hi-Fi audio signal-processing functions of earlier devices and aims at even lower power operation in power saving modes.

Functions

- High fidelity audio signal record and playback processing
- Head amplifier for Hi-Fi Audio signal
- CANAL switch
- Package: QFP80 (14 × 14)



Video and Audio Signal-Processing IC

LA71730EM

New product

Overview

The LA71730EM is a video signal-processing system IC that handles VHS VCR formats other than SECAM. It supports the PAL (G, B, I, M, and N), NTSC-M, 4.4.3 NTSC, MESECAM, and NAP (G, B, I, M, and N) formats. Chip internal trimming is used to make this IC fully adjustment free.

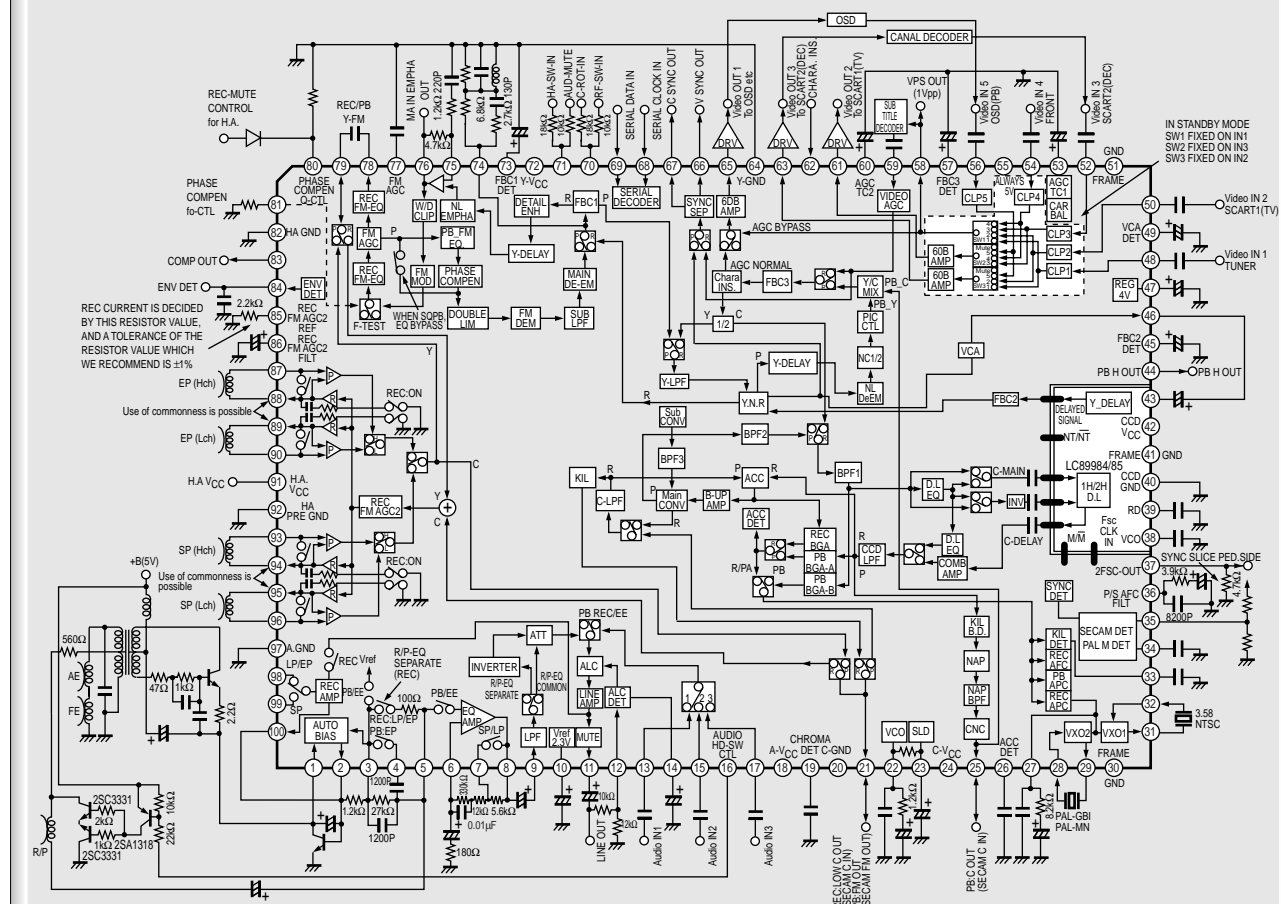
This IC significantly reduces the number of peripheral components required, thus providing substantial cost savings in the signal-processing board.

Additionally, this IC also supports the NAP standard (NTSC to PAL conversion) that is now common in Europe and China.

Functions

- Multi-format VHS VCR video signal record and playback processing
- VHS VCR audio signal record and playback processing
- I²C bus serial control
- Package: QIP100EJ (14 × 20)

Block Diagram



VCR SECAM Chrominance Signal-Processing IC

LA70100M

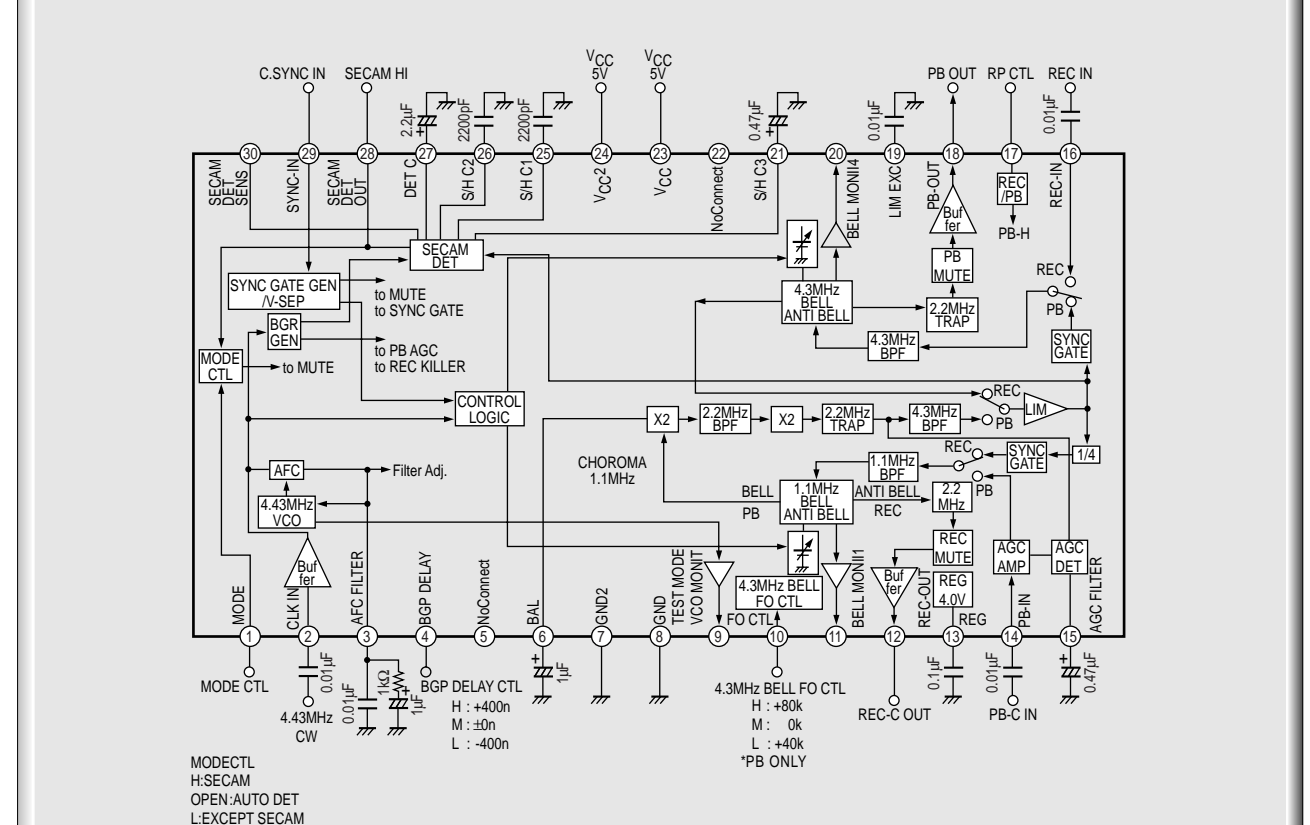
Overview

The LA70100M is a SECAM VCR chrominance signal processing IC. It integrates bandpass filter, SECAM discrimination, and Bell filter circuits to significantly reduce the number of peripheral components required and can support adjustment-free designs.

Functions

- Integrates all required filters on a single chip
- Automatic adjustment of the Bell filter f₀ frequency
- Built-in SECAM discrimination circuit
- Package: MFP30SD (375mil)

Block Diagram



On-Screen Display Controller IC

LC74785/M

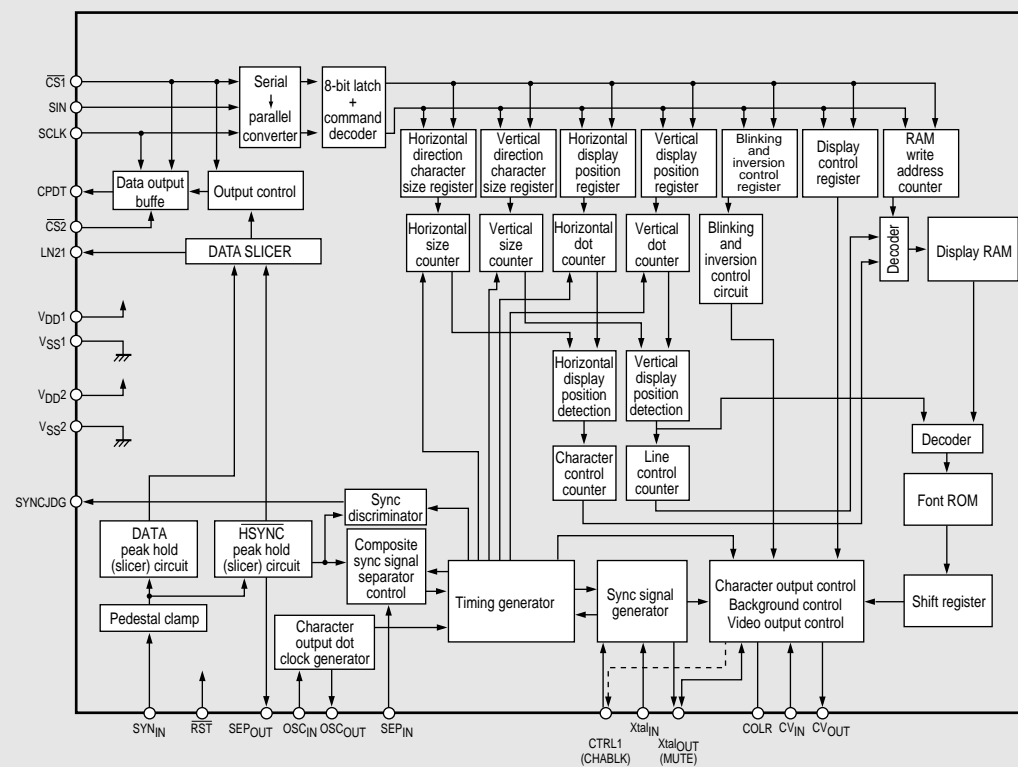
Overview

The LC74785 and LC74785M are integrated EDS on-screen display CMOS ICs that display text and patterns on the TV screen under control of a microcontroller. The LC74785 and LC74785M display 12 × 18 dot characters in a display area of 12 lines by 24 columns.

Functions

- Display structure: 12 lines × 24 characters (up to 288 characters)
- Character structure: 12 × 18 dots (H × V)
- Character sizes: Three sizes in each of the horizontal and vertical directions
- Number of characters: 128 characters
- Display start positions: Horizontal: 64 positions, vertical: 64 positions
- Blinking: Specified in horizontal units
- Types of blinking: Two: periods of 1.0 and 0.5 seconds
- Blinking of the whole character area (12 × 18 dots)
- Background color: 8 colors (internal synchronization operation) at 4 fsc
6 colors (internal synchronization operation) at 2 fsc
- Line background color: Can be set for up to 3 lines
Line background color: 8 colors (internal synchronization operation) at 4 fsc
Line background color: 6 colors (internal synchronization operation) at 2 fsc
- External control input: 8-bit serial interface
- Built-in sync separator circuit
- EDS support
- Video input: NTSC composite video signal
- Packages: LC74785: DIP24S (300mil)
LC74785M: MFP24 (375mil)

Block Diagram



On-Screen Display Controller IC

LC74789/M/JM

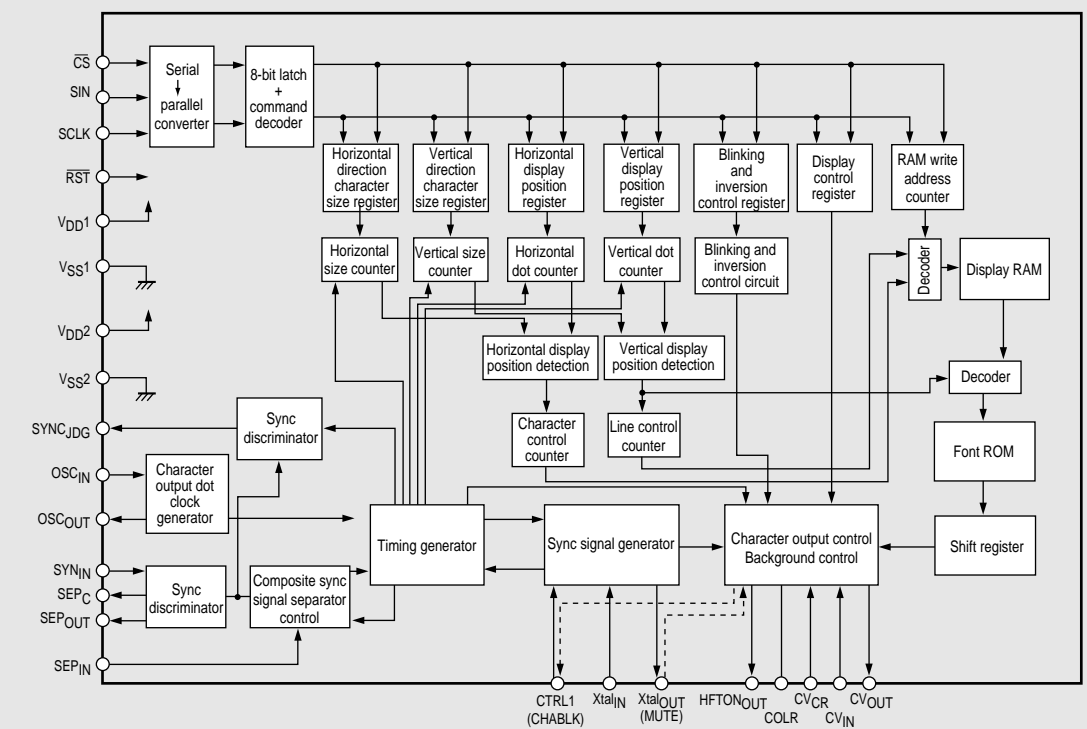
Overview

The LC74789, LC74789M, and LC74789JM are on-screen display CMOS ICs that display text and patterns on the TV screen under control of a microcontroller. The LC74789, LC74789M, and LC74789JM display 12 × 18 dot characters in a display area of 12 lines by 24 columns.

Functions

- Display structure: 12 lines × 24 characters (up to 288 characters)
- Character structure: 12 × 18 dots (H × V)
- Character size: Three sizes in each of the horizontal and vertical directions
- Number of characters: 256 characters (254 characters, one space character, one transparent space character)
- Display start positions: Horizontal: 64 positions, vertical: 64 positions
- Blinking: Specified in horizontal units
- Types of blinking: Two: periods of 1.0 and 0.5 seconds
- Blinking of the whole character area (12 × 18 dots)
- Background color: 8 colors (internal synchronization operation) at both 2 and 4 fsc
- Line background color: Can be set for up to 3 lines
Line background color: 8 colors (internal synchronization operation) at both 2 and 4 fsc
- External control input: 8-bit serial interface
- Built-in sync separator circuit
- Video signal inputs: NTSC, PAL, PAL-N, PAL-M, NTSC 4.43, and PAL60 composite video signals
- Packages: LC74789: DIP24S (300mil), LC74789M: MFP24 (375mil), LC74789JM: MFP24S (300mil)

Block Diagram



On-Screen Display Controller IC

LC74776/M

Overview

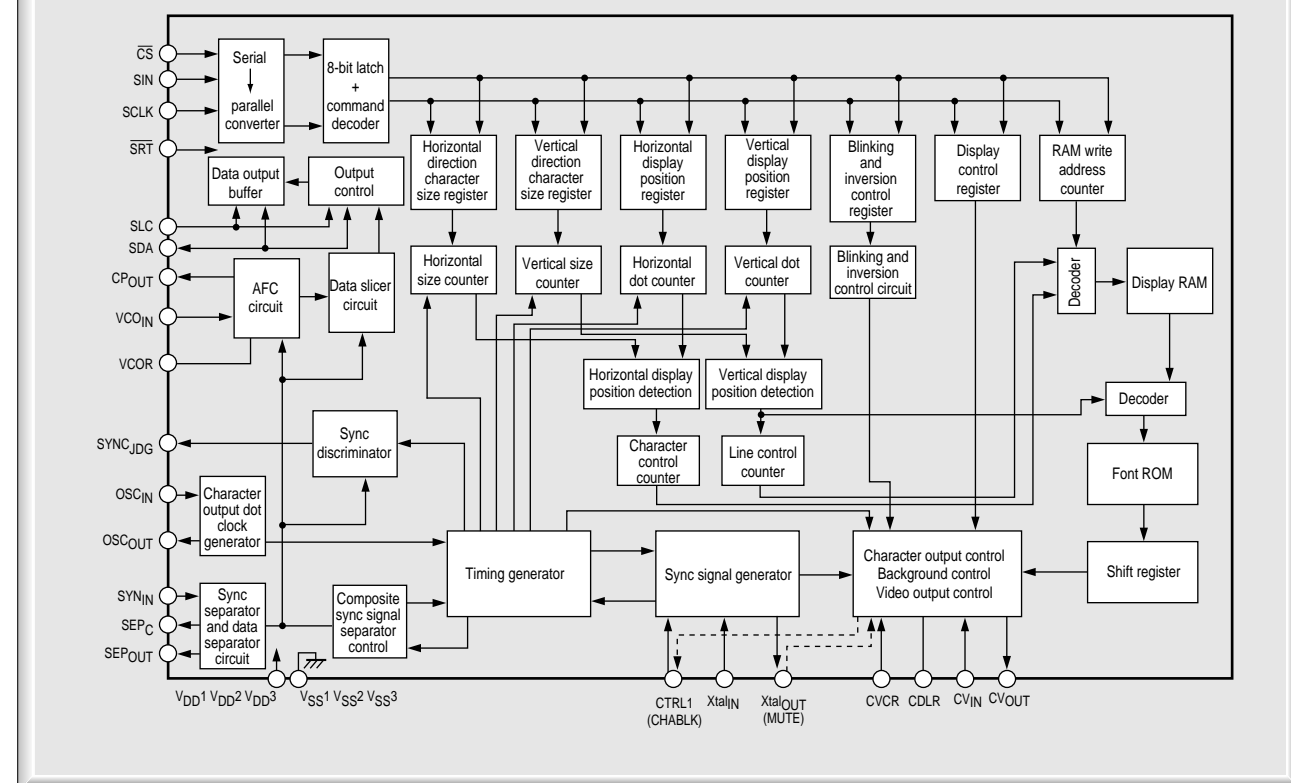
The LC74776 and LC74776M are integrated PDC/VPS/UDT interface circuit on-screen display CMOS ICs that display text and patterns on the TV screen under control of a microcontroller.

The LC74776 and LC74776M display 12 × 18 dot characters in a display area of 12 lines by 24 columns.

Functions

- Display structure: 12 lines × 24 characters (up to 288 characters)
- Character structure: 12 × 18 dots (H × V)
- Character sizes: Three sizes in each of the horizontal and vertical directions
- Number of characters: 256 characters (256 characters, one space character, one transparent space character)
- Display start positions: Horizontal: 64 positions, vertical: 64 positions
- Blinking: Specified in character units
- Types of blinking: Two: periods of 1.0 and 0.5 seconds
- Blinking of the whole character area (12 × 18 dots)
- Background color: 8 colors (internal synchronization operation) at both 2 and 4 fsc
Blue background only: NTSC
- Line background color: Can be set for up to 3 lines
Line background color: 8 colors (internal synchronization operation) at both 2 and 4 fsc
- External control input: 8-bit serial interface
- Built-in sync separator circuit
- Video signal input: PAL or NTSC composite video signal
- Built-in PDC/VPS/UDT interface (I²C bus support)
- Packages: LC74776: DIP30SD (400mil)
LC74776M: MFP30S (375mil)

Block Diagram



VPS/PDC Slicer IC

LC74793/JM

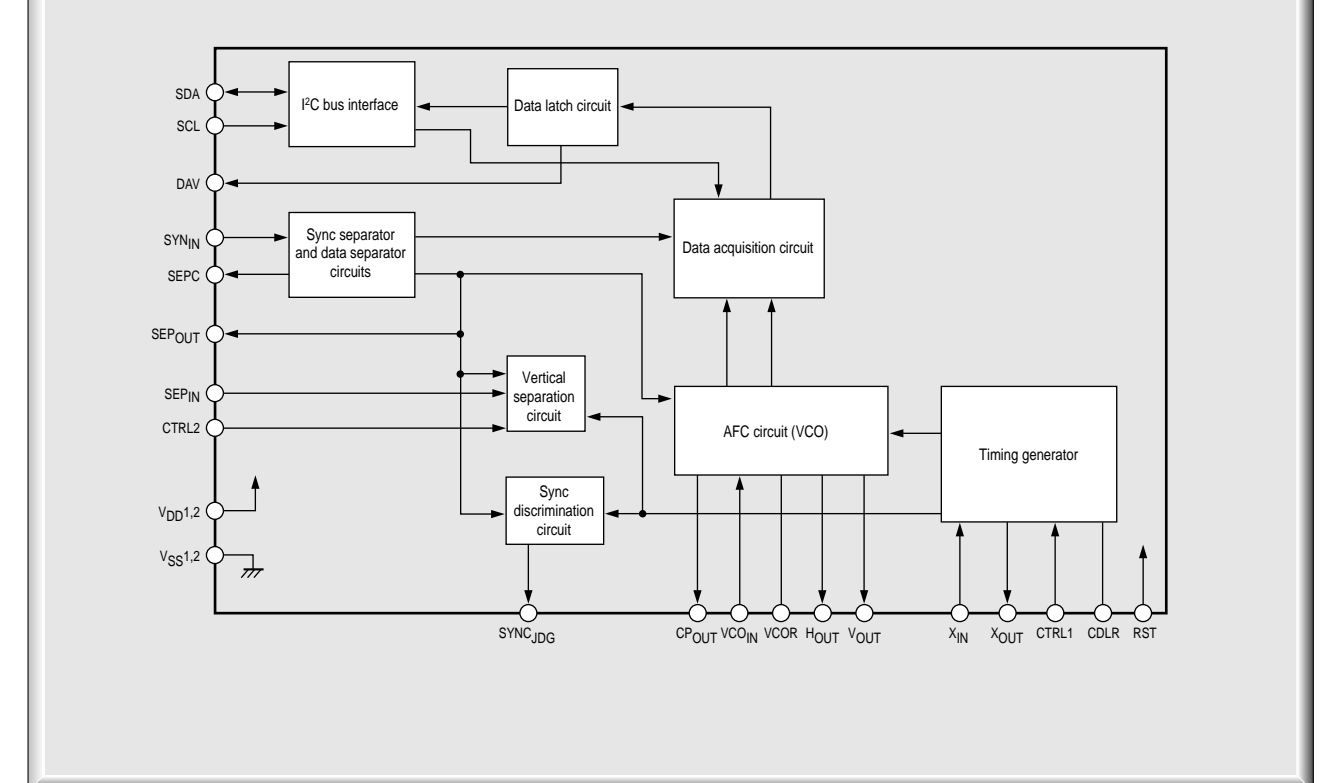
Overview

The LC74793 and LC74793JM are PDC/VPS/UDT interface CMOS ICs. The operating mode can be set and the data acquired in the various modes can be read out by a microcontroller.

Functions

- VPS data acquisition (bytes 5 and 11 to 15)
VPS: Video Program System
- PDC (8/30/2) data acquisition (bytes 13 to 25)
PDC: Program Delivery Control
- UDT (8/30/1) data acquisition (bytes 13 to 25)
UDT: Unified Date and Time
- Header (X/00) data acquisition (bytes 14 to 45)
- Status display (8/30/1, 8/30/2) data acquisition (bytes 26 to 45)
- Automatic VPS/PDC discrimination mode
- Sync separator and AFC circuits
- Sync discrimination circuit
- I²C bus support
- Packages: LC74793: DIP24S (300mil)
LC74793JM: MFP24S (300mil)

Block Diagram



LA7161NM/NV New product

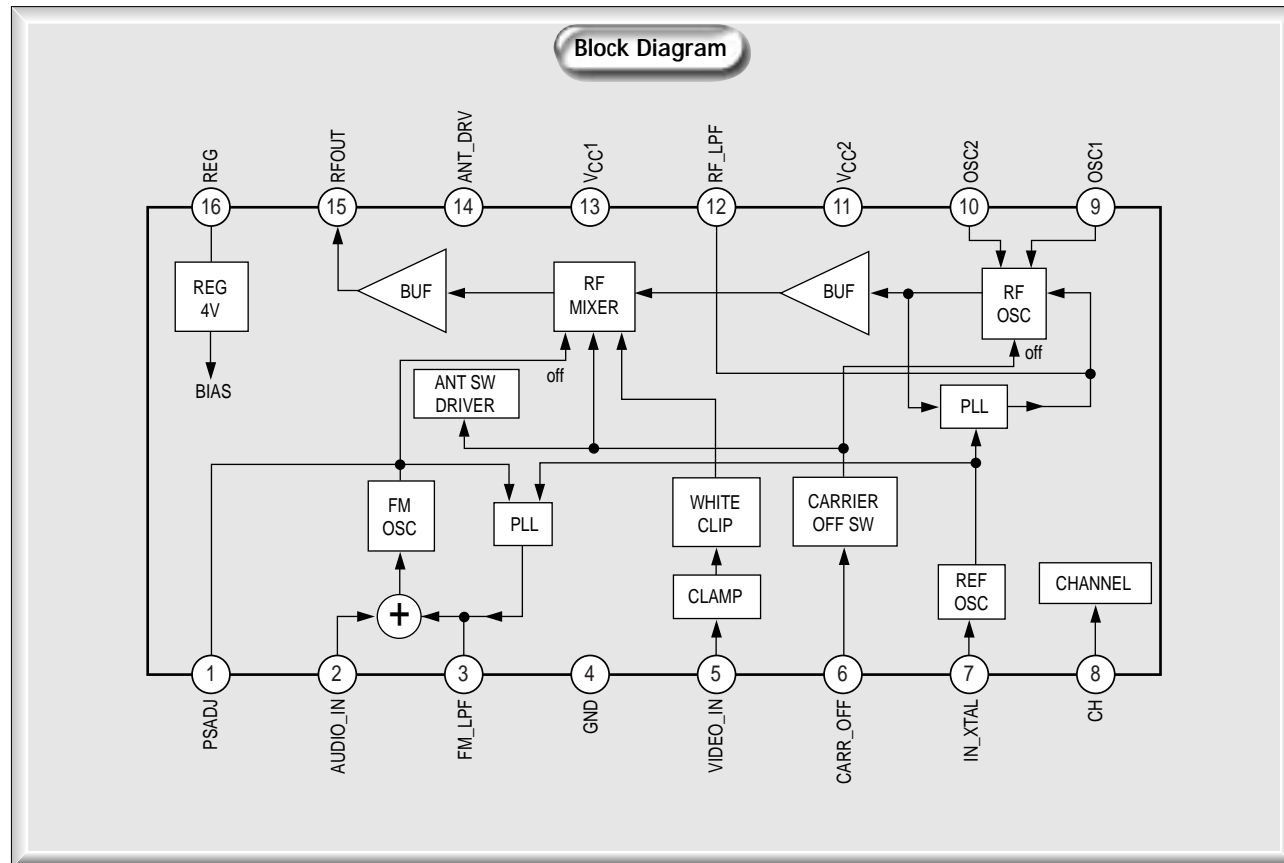
Overview

The LA7161NM and LA7161NV are VHF band RF modules that support channels 3 and 4 in the US, channels 1 and 2 in Japan, and channel 13 in Taiwan.

Functions

- RF VCO
- RF mixer
- RF buffer
- Video clamp
- White clipping
- FM audio demodulator
- 4 V regulator
- Reference oscillator
- Packages: LA7161NM: MFP16 (225mil)
LA7161NV: SSOP16 (225mil)

Block Diagram



LA77000V Development

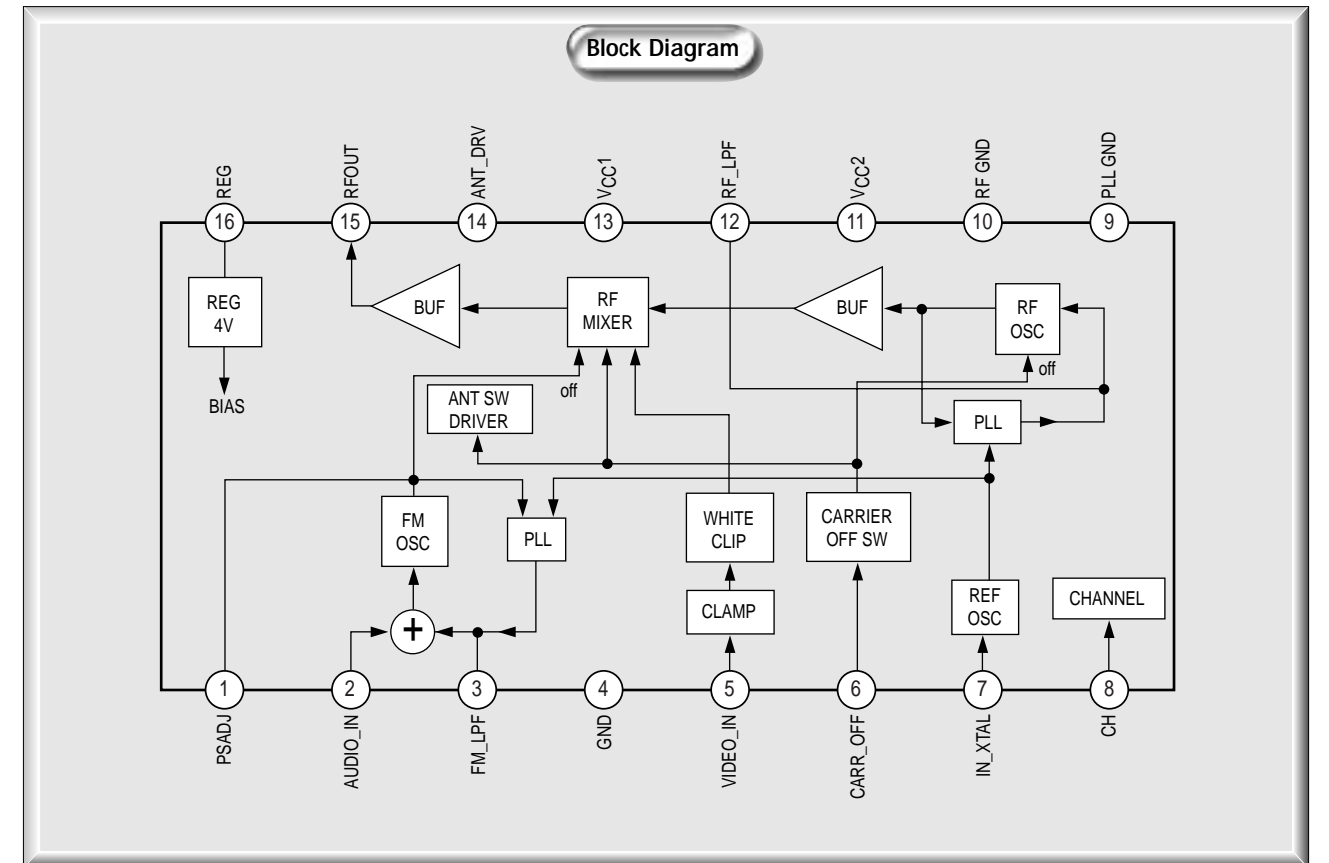
Overview

The LA77000V is a VHF band RF module that supports channels 3 and 4 in the US.

Functions

- RF VCO
- RF mixer
- RF buffer
- Video clamp
- White clipping
- FM audio demodulator
- 4 V regulator
- Reference oscillator
- Package: SSOP16 (225mil)

Block Diagram

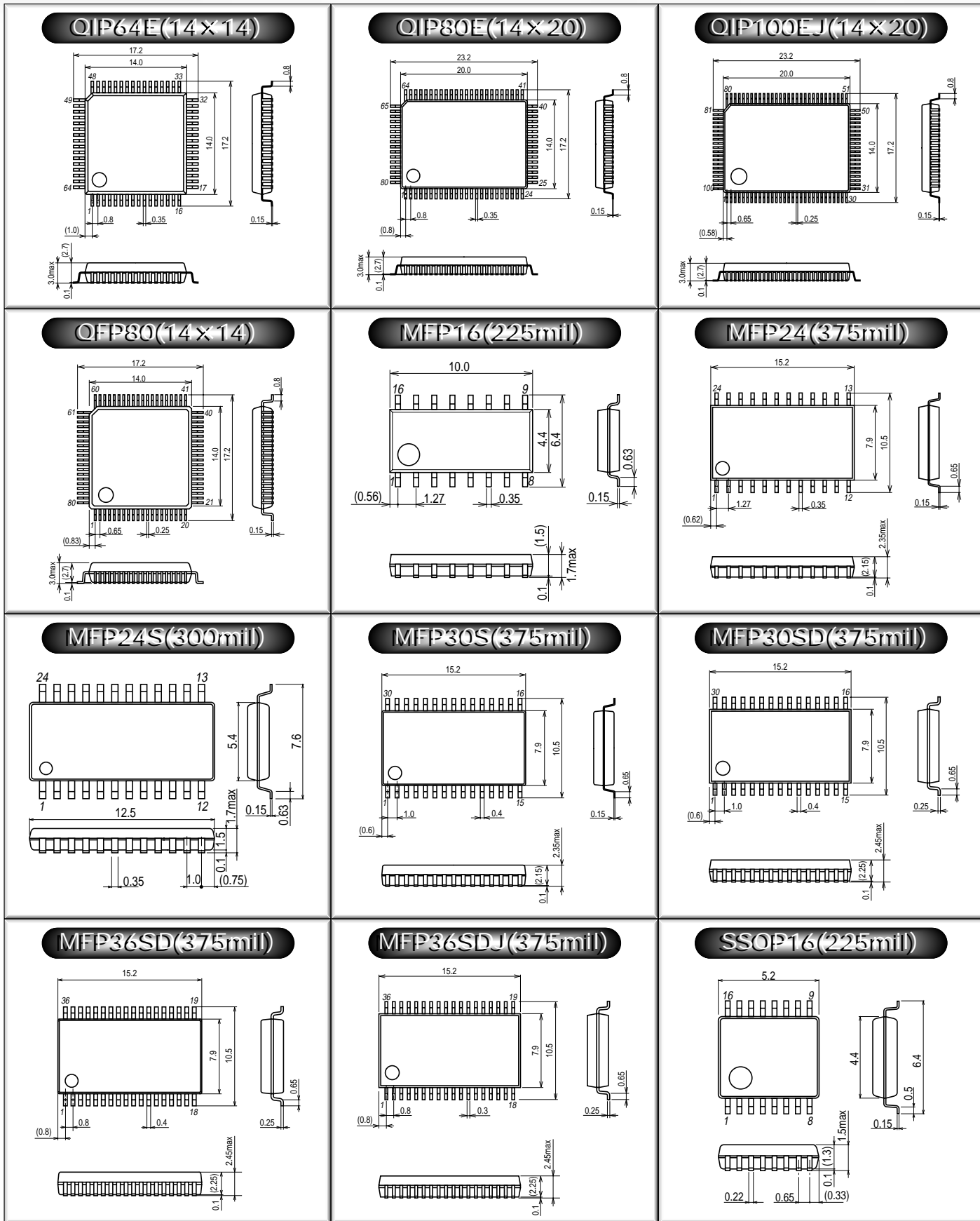


Package Dimensions

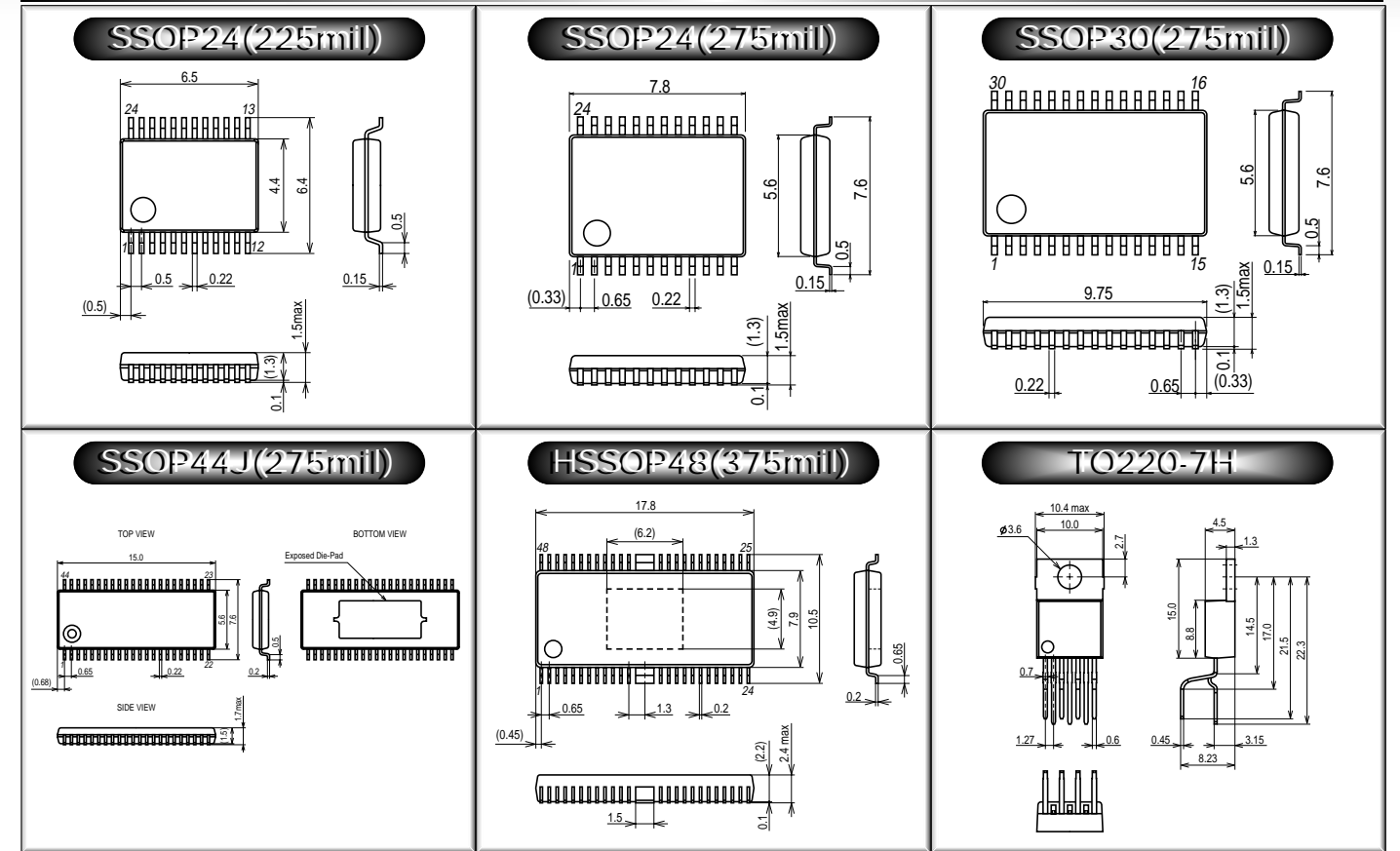
(Reference Drawing) (unit:mm)

(Reference Drawing) (unit:mm)

QIP/QFP/MFP/SSOP



SSOP/HSSOP/TO



Notes on Package Types and Naming
 The package names used in this documentation are designed to indicate rough classification of the packages used, and do not necessarily indicate the formal name of each individual package. Refer to the delivery specifications document for the particular product for the package dimensions figure and the formal name of the package.